

Commercial Peak Shaving Battery Parameters - Official Commercial BESS

Technical Overview & Datasheet

COMMERCIAL PEAK SHAVING BATTERY PARAMETERS - OFFICIAL COMMERCIAL BESS TECHNICAL OVERVIEW & DATASHEET

EXECUTIVE SUMMARY

This document provides a comprehensive technical overview and performance datasheet for our state-of-the-art Commercial Battery Energy Storage System (BESS), specifically engineered for peak shaving applications in commercial and industrial (C&I) environments. As energy costs continue to escalate and grid instability becomes more prevalent, the ability to strategically manage and reduce peak demand charges is paramount for operational profitability and energy security.

This platform represents a paradigm shift in distributed energy storage, offering a seamless, turnkey solution that integrates Tier-1 LFP battery cells, a high-efficiency bi-directional Power Conversion System (PCS), and an intelligent Energy Management System (EMS). The system is architected to deliver guaranteed performance, safety, and reliability, making it the definitive choice for facility managers, system integrators, and energy consultants seeking to optimize their energy spend and enhance grid resilience.

Designed for immediate deployment, this commercial BESS is the backbone of modern energy infrastructure, enabling facilities to reduce demand charges by up to 30% and unlock new revenue streams through demand response programs and energy arbitrage.



SYSTEM ARCHITECTURE & SAFETY

Our Commercial BESS is a fully integrated, plug-and-play system housed within a robust outdoor-rated enclosure. The architecture is centered around a high-voltage, Tier-1 LFP battery rack, which provides a safe and durable energy reservoir. This battery pack is managed by a three-tier Battery Management System (BMS) that monitors and controls every individual cell, ensuring optimal performance, longevity, and absolute safety.

The system is specifically engineered for rigorous peak shaving duty cycles, utilizing an advanced liquid cooling technology. This system provides unparalleled temperature regulation, directly impacting the system's lifetime, round-trip efficiency, and charge/discharge capabilities. The liquid cooling circuit actively manages cell temperatures to within a remarkably tight tolerance, preventing thermal imbalances that degrade cell health. The system incorporates multiple safety mechanisms, including a multi-level fire suppression system, active equalization circuits, and a reinforced, weatherproof chassis rated to IP55/NEMA 3R, ensuring dependable operation in a wide range of environmental conditions.

KEY FEATURES

- Precision Peak Shaving: Intelligent EMS and high-discharge rates (up to 1C) enable aggressive shaving of demand peaks, significantly reducing utility demand charges.
- Tier-1 LFP Cell Integrity: Utilizes premium LFP cells with a proven cycle life of over 6,000 cycles at 90% DoD, ensuring high operational reliability and low total cost of ownership.
- Advanced Liquid Cooling System: Maintains superior temperature uniformity across the battery pack, boosting system performance, extending battery life,

and enabling a high power density.

- Ultra-High Round-Trip Efficiency (RTE): Achieves a market-leading DC-to-AC round-trip efficiency of >92%, maximizing the economic value of every stored kilowatt-hour.
- Turnkey & Scalable Design: Modular architecture allows for simple parallel expansion, scaling from 215 kWh to multi-MWh systems without the need for complex engineering.
- Advanced Safety & Protection: Integrated with a multi-level fire suppression system (aerosol and/or gas-based) and fully compliant with UL 9540 and IEC 62619 standards.
- Cloud-Based EMS Interface: Integrated smart control logic enables real-time monitoring, predictive analytics, remote firmware upgrades, and seamless integration with on-site PV and EV charging infrastructure.

COMPLIANCE & STANDARDS

The Commercial BESS is designed and rigorously tested to meet the highest international safety and performance standards, ensuring seamless global deployment and operational peace of mind.

- UL 9540: Standard for Safety of Energy Storage Systems and Equipment.
- UL 9540A: Standard for Test Method for Thermal Runaway Fire Propagation in

Battery Energy Storage Systems.

- IEC 62619: Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium cells and batteries.
- IEC 62477-1: Safety requirements for power electronic converter systems and equipment.
- UN 38.3: Transport of Dangerous Goods, Manual of Tests and Criteria.
- IEEE 1547 / IEC 61727: Standard for Interconnecting Distributed Resources with Electric Power Systems.
- EMC: EN 61000-6-2, EN 61000-6-4 for industrial environments.

TECHNICAL SPECIFICATIONS

Parameter	Specification
Battery Cell Chemistry	Tier-1 LFP (Lithium Iron Phosphate)
Nominal Capacity	215 kWh / 372 kWh per cabinet
Usable Energy (at 90% DoD)	193 kWh / 334 kWh
System Voltage	700 - 900 Vdc (Nominal: 768 Vdc)
Round-Trip Efficiency (DC to AC)	> 92%
Cooling Method	Advanced Liquid Cooling
Operating Temperature Range	-20°C to +50°C (derated above 45°C)
Cycle Life	> 6,000 cycles at 90% DoD, 25°C
AC Output Voltage	480 Vac, 3-Phase, 4-Wire

Frequency	50/60 Hz
Maximum AC Power (Discharge)	100 kW / 200 kW
Peak AC Power (15s)	110% of nominal power
Response Time (Full Power)	< 100 ms
Dimensions (W x D x H)	~ 1,200 x 1,600 x 2,100 mm
Weight	~ 2,500 kg
Enclosure Protection	IP55 / NEMA 3R
Communication Protocols	Modbus TCP/RTU, CAN, IEC 61850
Compliance	UL 9540, UL 9540A, IEC 62619



INDUSTRIAL DEPLOYMENT

The system is versatile and designed for a wide range of industrial applications. It is ideally suited for manufacturing plants, data centers, cold storage facilities, large retail centers, university campuses, and EV fast-charging stations. In a typical deployment, the BESS is connected behind the utility meter, charging during periods of low demand or off-peak tariffs, and discharging during periods of peak load to mitigate demand spikes. This core functionality not only slashes electricity bills but also improves the facility's power factor and provides a reliable backup power source during grid outages.

By integrating the Commercial BESS with on-site solar PV, facilities can achieve true energy independence and maximize their return on investment. This platform serves as the central hub for micro-grids, creating a resilient and sustainable energy ecosystem that is future-proof against rising energy costs and evolving grid regulations.