

Turnkey C&I Energy Storage Solution Brief: Deploying Integrated Energy Storage Solutions

TURNKEY C&I ENERGY STORAGE SOLUTION BRIEF: DEPLOYING INTEGRATED ENERGY STORAGE SOLUTIONS

EXECUTIVE SUMMARY

This document serves as the official product overview and technical datasheet for the Integrated Energy Storage Solutions platform, a turnkey commercial and industrial (C&I) energy storage system designed for high-efficiency peak shaving, demand charge reduction, and renewable energy self-consumption optimization. Engineered with Tier-1 lithium iron phosphate (LFP) battery cells and advanced liquid cooling technology, this platform delivers unparalleled safety, cycle life, and energy density in a compact, outdoor-rated enclosure. The solution is fully pre-assembled, factory-tested, and ready for rapid deployment, significantly reducing installation costs and project timelines.



SYSTEM ARCHITECTURE & SAFETY

The Integrated Energy Storage Solutions platform is built upon a modular, three-level architecture comprising the battery system, the power conversion system (PCS), and the energy management system (EMS). The battery rack integrates prismatic LFP cells with a distributed battery management system (BMS) that monitors voltage, current, and temperature at the cell and module level. The bi-directional PCS provides seamless grid-interfacing capabilities, supporting both grid-tied and islanded operation modes with a total harmonic distortion (THD) of less than 3%. The intelligent EMS, equipped with cloud-based monitoring and control, executes sophisticated energy arbitrage and peak shaving algorithms, optimizing system dispatch in real-time based on load profiles and utility tariff structures.

Safety is embedded at every layer of the system design. The liquid cooling loop maintains cell temperatures within an optimal operating range of 25°C to 35°C, preventing thermal runaway and extending cycle life. The enclosure is constructed from fire-resistant, weatherproof materials and incorporates a multi-stage active fire suppression system, including aerosol-based agents and a dedicated exhaust pathway. The system is certified to UL 9540, UL 9540A, and IEC 62619, ensuring compliance with the most stringent global safety standards.

KEY FEATURES

- Peak Shaving and Demand Management: The system automatically discharges stored energy during peak demand periods, effectively shaving demand spikes and reducing demand charges by up to 40%.
- Grid Independence and Backup Power: Provides seamless transition to island mode within 20 milliseconds, ensuring critical loads remain operational during grid outages.
- Advanced Liquid Cooling: Maintains battery temperature within a uniform range, enhancing cycle life by 15% and preventing derating at high ambient temperatures up to 50°C.
- Modular and Scalable: The system supports parallel expansion up to 10 cabinets, allowing capacity to scale from 215 kWh to over 2 MWh per

installation.

- Comprehensive EMS: Features a user-friendly interface for remote monitoring, real-time performance analytics, and automated dispatch scheduling.
- Tier-1 LFP Cell Integration: Leverages prismatic LFP cells with over 8,000 cycles at 80% depth of discharge (DOD), ensuring long-term operational reliability and financial returns.

COMPLIANCE & STANDARDS

The Integrated Energy Storage Solutions platform meets all relevant international, regional, and local standards, providing full regulatory compliance and facilitating smooth project permitting.

- Safety Standards: UL 9540, UL 9540A, IEC 62619, UN 38.3
- Grid Interconnection: IEEE 1547, IEC 61727, VDE-AR-N 4105
- Electromagnetic Compatibility: FCC Part 15, EN 61000 series
- Environmental: CE, RoHS, REACH compliant

Parameter	Specification
Nominal Capacity	215 kWh / 372 kWh per cabinet
Cooling Method	Active liquid cooling with glycol-water mixture

Cell Chemistry	Prismatic LFP, Tier-1
Nominal Voltage	768 V DC
Max Charge/Discharge Power	100 kW / 186 kW
Round-trip Efficiency	> 92% (at 25°C, 0.5C rate)
Cycle Life	> 8,000 cycles (at 80% DOD, 25°C)
Operating Temperature Range	-20°C to +50°C
Enclosure Rating	IP54
Dimensions (W x D x H)	1,600 mm x 1,300 mm x 2,150 mm

TECHNICAL SPECIFICATIONS

- Model: ESS-C&I-215/372
- Nominal Energy: 215 kWh / 372 kWh per cabinet
- Usable Energy: 193.5 kWh / 334.8 kWh (at 90% DOD)
- Battery Cell Chemistry: Prismatic LFP, Tier-1
- Nominal Voltage: 768 V / 768 V DC
- Operating Voltage Range: 600 V – 850 V DC
- Max Charge/Discharge Power: 100 kW / 186 kW
- Cooling Method: Active liquid cooling with glycol-water mixture
- Operating Temperature Range: -20°C to +50°C
- Enclosure Rating: IP54

- Round-trip Efficiency: > 92% (at 25°C, 0.5C rate)
- Cycle Life: > 8,000 cycles (at 80% DOD, 25°C)
- Communication Protocols: Modbus TCP, CAN, IEC 61850
- Weight: Approx. 2,500 kg (215 kWh cabinet)
- Dimensions (W x D x H): 1,600 mm x 1,300 mm x 2,150 mm

INDUSTRIAL DEPLOYMENT

The Integrated Energy Storage Solutions platform is ideally suited for a wide range of commercial and industrial applications, including manufacturing facilities, data centers, retail chains, and EV charging hubs. Its turnkey design and compact footprint enable quick and cost-effective installation on concrete pads or existing concrete slabs. The platform supports both AC and DC coupling, providing flexibility for new construction or retrofit projects. With its robust performance, scalable architecture, and comprehensive safety features, the system delivers a compelling return on investment, with typical payback periods of 3–5 years depending on local tariff structures and incentives.

