

Turnkey C&I Energy Storage Solution Brief: Deploying Global B2B Supply Chain Strategic Partner Profile

EXECUTIVE SUMMARY

The Global B2B Supply Chain Strategic Partner Profile represents a tier-one commercial and industrial (C&I) energy storage platform engineered for organizations seeking to secure resilient, cost-optimized power infrastructure through a fully integrated OEM supply partnership. This document defines the technical architecture, safety envelope, and commercial positioning of a modular battery energy storage system (BESS) designed to serve as the backbone of enterprise decarbonization strategies. The platform leverages vertically integrated Tier-1 LFP cell manufacturing, smart liquid cooling, and bi-directional PCS grid interfacing to deliver a turnkey solution spanning procurement, deployment, and lifecycle management. With nominal cabinet capacities ranging from 215 kWh to 372 kWh and parallel expansion capability exceeding MWh-scale, the system is purpose-built for peak shaving, demand response, and micro-grid islanding applications across manufacturing facilities, industrial parks, and EV supercharging hubs.



SYSTEM ARCHITECTURE & SAFETY

The storage platform is constructed around a high-voltage DC bus architecture that integrates Tier-1 LFP prismatic cells into modular rack assemblies, each managed by a multi-level Battery Management System (BMS) providing cell-level voltage and temperature monitoring. The BMS employs active equalization protocols to maintain state-of-charge uniformity across series-connected modules, extending usable capacity and mitigating degradation drift. Thermal regulation is achieved through a closed-loop smart liquid cooling pipeline that maintains cell operating temperatures within a narrow band, significantly reducing thermal runaway risk compared to air-cooled alternatives. Multi-level suppression protocols include cell-level ceramic separators, module-level aerosol fire suppression, and container-level inert gas flooding, all coordinated by an integrated Fire Alarm Control Panel

(FACP). The PCS bi-directional inverter enables seamless grid-tied, off-grid, and islanded operation, with automatic transfer switching (ATS) logic governing seamless switchover during grid faults.

KEY FEATURES

- Tier-1 LFP Cell Integration: Prismatic LFP cells sourced from top-tier manufacturers, delivering high thermal stability and cycle life exceeding 6,000 cycles at 80% depth of discharge.
- Smart Liquid Cooling: Closed-loop liquid cooling with integrated coolant distribution unit (CDU) maintains temperature differentials below 3°C across modules, optimizing round-trip efficiency.
- Modular Parallel Expansion: DC busbar parallel architecture supports up to 16 cabinets in parallel, enabling scalable capacity from 215 kWh to MWh-scale without additional PCS hardware.
- Bi-directional PCS Grid Interfacing: Four-quadrant PCS enables active and reactive power control, voltage/frequency ride-through, and seamless islanding for micro-grid resilience.
- Multi-Level Safety Suppression: Cell, module, and container-level fire suppression with NFPA 855 and UL 9540A compliance for thermal runaway propagation mitigation.
- Cloud-Connected EMS: Integrated Energy Management System (EMS) supports remote monitoring, dispatch scheduling, and demand response API

integration for utility program participation.

COMPLIANCE & STANDARDS

The Global B2B Supply Chain Strategic Partner Profile is engineered to meet the most stringent international safety, performance, and grid-interconnection standards. The platform holds UL 9540 certification for energy storage systems and UL 9540A validation for thermal runaway fire propagation resistance. Cell-level compliance includes UL 1973 and IEC 62619, while the PCS assembly conforms to UL 1741 SA and IEEE 1547 for grid interconnection. Additional accreditations include IEC 62933 for electrical energy storage systems, CE marking for European deployment, and UN 38.3 for transport safety. The system is designed for compliance with NFPA 855 installation standards and carries a comprehensive global warranty program covering 10 years or 6,000 cycles, whichever occurs first.

TECHNICAL SPECIFICATIONS

The following specification matrix outlines the core performance parameters of the standard 372 kWh cabinet configuration. All values are nominal at 25°C ambient temperature and 0.5C charge/discharge rate unless otherwise noted.

Parameter	Specification
Nominal Capacity	372 kWh per cabinet (215 kWh compact option available)
Cell Chemistry	Tier-1 LFP (Lithium Iron Phosphate), prismatic format
Cooling Method	Smart Liquid Cooling, closed-loop CDU with 3°C max ΔT
DC Voltage Range	1,000 VDC to 1,500 VDC nominal
Round-Trip Efficiency	$\geq 94\%$ at 0.5C, 25°C
Cycle Life	$\geq 6,000$ cycles at 80% DoD, 25°C, 0.5C
Depth of Discharge	95% usable (BOL), 90% at EOL
Operating Temperature	-20°C to +55°C (derated above 45°C)
Ingress Protection	IP55 / NEMA 3R
Dimensions (W×D×H)	1,200 mm × 1,100 mm × 2,200 mm
Weight	$\approx 3,200$ kg per cabinet
Communication Protocols	Modbus TCP, IEC 61850, OpenADR 2.0b, CAN 2.0B
Certifications	UL 9540, UL 9540A, UL 1973, IEC 62619, IEC 62933, CE
Warranty	10 years or 6,000 cycles, whichever occurs first

INDUSTRIAL DEPLOYMENT

The platform is optimized for deployment in commercial and industrial environments requiring high-power density and minimal footprint. Typical applications include peak shaving for manufacturing facilities with demand charges exceeding 500 kW, demand response participation in ancillary services markets, and micro-grid islanding for critical infrastructure. The outdoor-rated cabinet (IP55/NEMA 3R) supports pad-mounted installation with concrete plinths, requiring only level ground and grid interconnection. The integrated EMS provides Modbus TCP, IEC 61850, and OpenADR 2.0b interfaces for seamless integration with existing SCADA and building management systems. For EV supercharging deployments, the DC busbar supports direct coupling with 150 kW to 350 kW DC fast chargers, enabling buffer storage to mitigate demand spikes and reduce demand charges.

