ST835CS-4HPowerStack - Official Commercial BESS Technical Overview & Datasheet

ST835CS-4HPowerStack: OFFICIAL COMMERCIAL BESS TECHNICAL OVERVIEW & DATASHEET

EXECUTIVE SUMMARY

The ST835CS-4HPowerStack represents a paradigm shift in commercial & industrial (C&I) energy storage. Engineered as a high-power, liquid-cooled, modular cabinet system, this platform delivers grid-interactive intelligence for peak shaving, demand charge reduction, and backup power in micro-grid environments. Rated for extreme duty cycles, the system integrates Tier-1 LFP (Lithium Iron Phosphate) cells with a bi-directional 4-quadrant PCS, achieving a round-trip efficiency exceeding 92% at nominal power. Designed for outdoor deployment, the IP55 chassis ensures operation from -30 ° C to 50 ° C, significantly reducing auxiliary thermal energy spend.

SYSTEM ARCHITECTURE & SAFETY

The architecture is based on a 1500V DC busbar linking high-density battery racks to a 4H (4-hour) discharge optimized power stack. Each ST835CS-4HPowerStack unit operates as an independent grid node or scales via parallel AC coupling. The integrated Battery Management System (BMS) performs cell-level voltage and temperature monitoring with passive/active balancing algorithms. Safety is managed by a three-layer protection scheme: (1) Module-level fusing and contactors, (2) Rack-level circuit breakers with arc fault detection, and (3) a UL 9540A-compliant fire suppression system using aerosol-based agents. The liquid cooling loop maintains cell delta-T below 3°C, preventing thermal runaway propagation.

KEY FEATURES

- High-Density LFP Chemistry: Tier-1 prismatic cells rated for 8,000 cycles at 25° C (70% EOL). Zero cobalt content ensures low total cost of ownership (TCO).

- 4H Peak Shaving Profile: Optimized for industrial tariffs with 4-hour continuous discharge at full power. Supports simultaneous charging/discharging via EMS.

- Smart Liquid Thermal Management: Autonomous coolant circulation with PID control; consumes <3% of auxiliary power. Includes anti-condensation heating for sub-zero climates.

- Bi-directional PCS: 4-quadrant operation with seamless islanding (<20ms transfer time). Grid-forming and grid-following modes programmable per site.

- Cyber-secure EMS: Embedded Edge controller with Modbus TCP, IEC 61850, and DNP3 protocols. Local data logging with optional cloud aggregator for fleet O&M.

COMPLIANCE & STANDARDS

Fully certified for global markets. Key registrations: UL 1973, UL 9540 (pending), IEC 62619, IEC 62477, UN 38.3 (transport), CE, and VDE-AR-N 4105. The system meets NFPA 855 spacing requirements for outdoor cabinets (minimum 3m separation). All components are RoHS and REACH compliant. Factory witness testing available per ISO 9001:2025 protocols.

TECHNICAL SPECIFICATIONS

Parameter	**Specification**
Nominal Energy Capacity	835 kWh (DC, at 0.5C, +25°C)
Usable Energy (4H)	800 kWh (DoD 95%)
AC Rated Power (4H)	200 kW (grid-tied, PF=0.9)
Peak AC Power (10 sec)	260 kW
Nominal Voltage (DC)	1331.2 V
Voltage Range (DC)	1168 V – 1497.6 V
Max Charge/Discharge Current	280 A DC
Round-trip Efficiency (AC-AC)	≥92% @ rated power, +25°C
Cooling Method	Liquid-cooled (Ethylene glycol-water mix)
Operating Temperature	-30°C to +50°C (derated >45°C)
Protection Class	IP55 (cabinet), IP67 (connectors)
Cycle Life	8,000 cycles to 70% SOH (EOL)
Fire Suppression	Aerosol + Novec 1230 backup
Dimensions (W x D x H)	2,400 mm x 1,600 mm x 2,400 mm
Weight (total)	~9,200 kg
Protocols	Modbus TCP, IEC 61850, DNP3, CAN 2.0

Paralleling capacity: Up to 16 units (13.36 MWh total) via a common AC bus. AC overcurrent protection required per local code. Grid impedance must be <5% at PCC.

INDUSTRIAL DEPLOYMENT

Recommended for manufacturing facilities, data centers, EV charging hubs, and remote micro-grids. The 4HPowerStack designation ensures compatibility with existing 1,500V PV inverters for DC-coupled PV-storage-charging infrastructure. Mounting: concrete pad with integrated earthquake anchoring (tested to Zone 4 seismic). Maintenance access requires 1.2m front clearance and 0.8m rear clearance. Standard warranty: 10 years or 8,000 equivalent full cycles (whichever

occurs first) with optional performance SLAs.