

PDF Document

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Commercial BESS Technical Overview & Datasheet",
 "content": "TURNKEY CONTAINER ESS PROJECT MANAGEMENT
GUIDE\n\nOFFICIAL COMMERCIAL BESS TECHNICAL OVERVIEW &
DATASHEET\n\nDocument Version: 2.4 | Classification: Public | Release Date:
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2026\n\n-----
--\n\nEXECUTIVE SUMMARY\n\nThis document serves as the definitive
technical reference and project management framework for the deployment of
our Turnkey Containerized Energy Storage System (ESS). Designed for
Commercial & Industrial (C&I), utility-scale, and micro-grid applications, this
platform integrates Tier-1 LFP battery cells, a modular Power Conversion
System (PCS), and an advanced Liquid Thermal Management System into a
single, factory-assembled, and pre-commissioned ISO container.\n\nThis guide
provides project managers, system integrators, and EPC contractors with the
essential technical specifications, safety protocols, and deployment logic
required to ensure a seamless asset handover. The platform is engineered for
high availability, with a focus on minimizing Total Cost of Ownership (TCO) and
maximizing Return on Investment (ROI) through peak shaving, load shifting,
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and grid ancillary

services.

SYSTEM ARCHITECTURE & SAFETY

The system is built

upon a 4-layer safety and control architecture:

1. **Cell Layer:** Proprietary

prismatic LFP cells with low internal resistance and high thermal stability.

2. **Module Layer:** Integrated voltage/temperature monitoring with passive

balancing.

3. **Rack Layer:** High-voltage DC busbar isolation and

independent HVAC zones.

4. **System Layer:** Centralized Energy

Management System (EMS) with redundant Battery Management System (BMS)

and multi-level fire suppression (Aerosol + Gas extinguishing).

The

architecture supports parallel DC-side connection, allowing multiple containers

to be scaled up to multi-MWh sites without the need for additional central

inverters, reducing balance-of-system (BOS)

costs.

KEY FEATURES

- Feature 1: FACTORY INTEGRATION & TESTING (FAT):

Every unit undergoes a full Factory Acceptance Test before shipment, including

insulation resistance, polarity check, and full-load charge/discharge cycling to

ensure system integrity and reduce on-site commissioning time to less than 4

days.

- Feature 2: INTELLIGENT LIQUID COOLING SYSTEM (LCS): The

patented liquid cooling loop maintains cell temperature variance within  $\pm 2^{\circ}\text{C}$ ,

increasing the battery cycle life by over 15% compared to air-cooled systems.

The system is designed with anti-corrosion coolant and leak detection sensors for maximum reliability.

**Feature 3: ADVANCED FIRE SUPPRESSION & SAFETY:** Compliant with NFPA 855 and UL 9540, the system integrates a three-stage protection strategy: (1) Early warning gas detection, (2) Perfluorohexanone (Novec 1230 equivalent) total flooding, and (3) Water deluge interface (optional) for external firefighter use.

**Feature 4: BLACK START & GRID-FORMING CAPABILITY:** The PCS supports grid-forming operation for black start and micro-grid islanding scenarios, enabling seamless transition from grid-tied to off-grid modes (transfer time < 20ms).

**Feature 5: SMART PROJECT MANAGEMENT & CLOUD O&M:** The integrated EMS provides remote firmware updates, performance analytics, and predictive maintenance alerts through a secure 4G/Wi-Fi connection, allowing for centralized management of a fleet of assets.

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**COMPLIANCE & STANDARDS**

The system complies with the most stringent international safety and grid standards:

- Safety:** UL 9540 (US), UL 9540A (Thermal Runaway), IEC 62619 (Europe), UN 38.3 (Transportation).
- Grid:** IEEE 1547, IEC 61727, VDE-AR-N 4110.
- Environmental:** IP55 (Outdoor), C5 (Corrosion Protection), RoHS, REACH.

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**TECHNICAL SPECIFICATIONS**

The following parameters define the standard 20-foot ISO container configuration (DC-Coupled). All data presented

are verified under 25 °C ambient temperature and 100% Depth of Discharge (DoD)

conditions.

PROJECT MANAGEMENT & DEPLOYMENT (INDUSTRIAL DEPLOYMENT)

For a successful project lifecycle, the following management pillars are established:

1. **Site Survey & Engineering:** Our Pre-sales Engineering team provides detailed civil foundation drawings (load distribution:

30 tons/m<sup>2</sup>), cable sizing, and PCS layout plans to ensure the container is

correctly anchored and ventilated.

2. **Logistics:** Standard shipping container footprint (20ft or 40ft) allows for easy road, rail, or sea transport.

Offloading using a standard reach stacker or crane is supported (lifting lugs

integrated).

3. **Commissioning:** The "Plug & Play" interface simplifies the connection of AC grid power (480V/60Hz or 400V/50Hz), Ethernet, and CT

sensors. A step-by-step guided Commissioning Wizard on the local HMI

touchscreen automates the grid synchronization process.

4. **Warranty:** Standard product warranty is 10 years or 8,000 cycles (whichever comes first),

with extension options available for fleet

customers.

CONTACT & SUPPORT

For detailed engineering drawings, project-specific quoting, or to schedule a factory visit, please contact

your regional Sales Representative or our Global Pre-Sales Support Team.\n\n\*Specifications are subject to change without notice due to continuous product innovation and improvement.\*",

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"A high-quality 4K realistic promotional image showing a sleek, modular generic outdoor energy storage container deployed near solar arrays, sunset lighting, high tech vibe, unbranded chassis, no text.",

"A high-quality 4K realistic close-up image showing the hardware details, liquid cooling connectors, or smart EMS touch panel of the generic energy storage unit, professional lighting, unbranded components, no text."

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["Nominal Energy Capacity", "3.0 MWh (20ft) / 6.0 MWh (40ft)"],

["Nominal AC Power (PCS)", "1.5 MW (20ft) / 3.0 MW (40ft)"],

["Max AC Power (Boost)", "1.65 MW for 30 mins"],

["Cooling Method", "Smart Liquid Cooling (Anti-Corrosion Fluid)"],

["Cell Chemistry", "Tier-1 LFP (Lithium Iron Phosphate)"],

["Round-trip Efficiency", "Up to 92.5% (DC) / 87% (AC)"],

["DC Voltage Range", "750V – 1250V"],

["Operating Temperature", "-30°C to +55°C (Derating above 45°C)",

["Protection Class", "IP55 / C5 (Marine Grade)",

["Fire Suppression", "Novec 1230 (Aerosol Backup)",

["BMS Protocol", "CAN/RS485/Modbus TCP",

["Cycle Life", ">8,000 cycles @ 25°C, 0.5C / 0.5C"]

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