

Laser Welding Equipment Safety Declaration - Official Commercial BESS

Technical Overview & Datasheet

EXECUTIVE SUMMARY

This document serves as the official Laser Welding Equipment Safety Declaration for the commercial energy storage systems (BESS) manufactured and integrated by the Company. It confirms that all laser welding processes deployed in the fabrication of critical battery modules, busbars, and enclosure assemblies comply with applicable international safety standards and internal quality protocols.

The declaration applies to all Tier-1 LFP-based commercial and industrial energy storage cabinets, containerized systems, and associated power conversion equipment. It is issued to assure customers, integrators, and regulatory bodies that laser welding operations present no undue risk to personnel, facility infrastructure, or the final product's operational integrity.



SYSTEM ARCHITECTURE & SAFETY

The laser welding equipment used in production is fully enclosed within Class 1 laser safety housings, preventing any accessible laser radiation during normal operation. Interlock systems, emergency stop circuits, and real-time optical monitoring are integrated into every welding cell.

Welding fume extraction and filtration units capture particulate matter and gaseous byproducts at the source. All operators are trained and certified in laser safety, PPE usage, and emergency response procedures. The safety declaration extends to the final BESS product, where laser-welded joints are inspected via automated optical and electrical resistance checks before module assembly.

KEY FEATURES

- Class 1 Enclosed Laser Cells: Zero accessible radiation during production.
- Interlock & E-Stop Systems: Redundant safety circuits on all welding equipment.
- Fume Extraction: Integrated HEPA and activated carbon filtration.
- Weld Quality Monitoring: Real-time seam tracking and post-weld inspection.
- Certified Operators: Annual laser safety training and competency audits.
- Traceability: Each welded assembly logged with equipment ID and process parameters.

COMPLIANCE & STANDARDS

All laser welding equipment and processes conform to the following standards:

- IEC 60825-1: Safety of laser products
- ANSI Z136.1: Safe use of lasers
- ISO 11553-1: Laser processing machines – safety requirements
- EN 12198: Assessment and reduction of risks from radiation emitted by machinery
- UL 9540 & IEC 62619: As applicable to final BESS assembly

TECHNICAL SPECIFICATIONS

The following table summarizes the key safety and performance parameters of the laser welding equipment used in BESS production.

Parameter	Specification
Laser Class	Class 1 enclosed (production operation)
Wavelength	1070 nm ± 10 nm (fiber laser)
Max Output Power	6 kW (continuous)
Safety Interlock	Category 3, PL d (ISO 13849)
Fume Extraction	HEPA H13 + activated carbon
Weld Inspection	100% automated optical + resistance check
Operator Certification	Annual IEC 60825-1 training
Applicable Standards	IEC 60825-1, ANSI Z136.1, ISO 11553-1, EN 12198

INDUSTRIAL DEPLOYMENT

The laser welding safety declaration applies to all manufacturing sites producing commercial BESS hardware. Each facility maintains a Laser Safety Officer (LSO) responsible for compliance audits, incident reporting, and

continuous improvement of safety protocols.

Customers may request site-specific declarations or third-party audit reports as part of procurement due diligence. The declaration remains valid for the calendar year of issue unless superseded by regulatory updates or equipment modifications.

