Offline X-Ray Battery Inspection Machine High Resolution Cell Testing System

Item Number: DS17

Introduction

Enhance cell quality control with this offline X-ray battery inspection machine featuring a high-precision 130kV microfocus tube, four-axis motorized stage, real-time image analysis, and complete radiation safety shielding designed for demanding laboratory research and industrial cell defect verification workflows.

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Application	Description	Key Benefit
Pouch Cell Anode-Cathode Overhang Measurement	Non-destructive verification of internal electrode alignment and negative-to-positive foil overhang margins across the perimeter of stacked pouch cells.	Prevents lithium plating, internal dendritic growth, and thermal runaway risks by enforcing geometric manufacturing tolerances.
Cylindrical Cell Jelly-Roll & Tab Inspection	High-magnification radiography of wound 18650, 21700, and 4680 cylindrical formats to check tab weld integrity, inner winding deformation, and center-pin positioning.	Identifies mechanical winding collapse, misaligned internal current collectors, and incomplete tab bonds before final sealing.
Prismatic Cell Internal Component Verification	Penetrative scanning of aluminum-cased prismatic battery packs to inspect internal top-cap assemblies, electrode stack compression, and current collector connection points.	Validates structural stability against vibration stresses without requiring destructive physical decrimping or can opening.
Solid-State & Advanced Battery R&D	Radiographic analysis of novel solid electrolyte interfaces, metallic lithium anode distribution, and multi-layer structural uniformity under varying compression levels.	Accelerates material prototyping by revealing internal voiding, delamination, and phase uniformity during early development stages.
Ultrasonic & Laser Weld Quality Assurance	Sub-micron structural evaluation of ultrasonic tab-to-busbar joints and laser-welded terminal posts to detect porosity, micro-cracks, and lack of fusion.	Eliminates high-resistance electrical bottlenecks and mechanical joint failures within high-drain power battery designs.
Post-Mortem & Lifecycle Failure Analysis	Non-invasive forensic examination of cycled, swollen, or mechanically stressed test cells to diagnose internal structural degradation and layer shifting.	Preserves the exact physical failure state for root-cause analysis without introducing mechanical artifacts caused by destructive teardowns.

Parameter Category	Specification Parameter	Value / Detail (DS17)
Model Designation	System Identifier	DS17
Physical Dimensions	External Footprint (L × W × H)	1080 mm × 1180 mm × 1730 mm (subject to final engineering configuration)
	Overall System Weight	Approx. 1250 kg
	Chassis Finish Color	International Standard Warm Gray 1C
Environmental Requirements	Operating Temperature Range	0°C to 40°C
	Operating Humidity Range	30% to 70% RH (non-condensing)
Inspection Performance	Measurement & Inspection Accuracy	±0.06 mm (verified via standard calibration block)
	Effective Inspection Dimensions	420 mm × 360 mm
	Workstage Table Area	500 mm × 500 mm
X-Ray Generation System	Ray Source Type	Closed micro-focus X-ray tube
	Maximum Tube Voltage	130 kV

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	Focal Spot Dimension	< 7 μm
	Source Quantity	1 Complete Set
	Source Manufacturer	Unicomp
Detection & Imaging System	Detector Technology	High-resolution digital flat panel detector (FPD)
	Detector Model	1313HR
	Active Imaging Area	130 mm × 130 mm
	Detector Manufacturer	Careray
Motion Control System	Motorized Axes	4-Axis synchronized control (X / Y / Z1 / Z2)
Software & UI	Software Architecture	Proprietary multi-functional image processing software suite
	Inspection Capabilities	Real-time live dynamic radioscopy & high-precision manual inspection
	Software Language	English
	Peripherals & User Interface	22-inch LCD monitor, industrial joystick, mouse, keyboard, status indicator tower
Radiation & Safety	Radiation Dose Rate Standard	< 1.0 μSv/h (at full tube output)
	Enclosure Construction	Heavy-gauge steel plate encasing solid lead shielding layers
	Viewing Window	Certified optical-grade thick lead shielding glass
	Safety Interlock System	High-sensitivity dual-channel limit switches on all doors; instant automatic X-ray cut-off
Electrical Specifications	Input Voltage	AC 110–220V (±10%), 50/60 Hz single-phase
	Maximum Power Consumption	Approx. 3.0 kW