

Product Overview

The KingPo KP-6061C Medical Bed Load and Impact Test System is a professional mechanical testing platform designed for dynamic loading, mattress support platform impact, body-weight load simulation, and stability-related pressure loading tests on medical beds. It supports selected test methods from IEC 60601-2-52, YY 9706.252-2021, and GB 9706.1-2020, ensuring comprehensive evaluation of mechanical safety and durability for hospital beds, nursing beds, rehabilitation beds, and adjustable medical bed structures.

The system integrates servo-driven loading mechanisms, standardized loading pads, impactor assemblies, counterweight simulation modules, and a PLC + 7-inch touchscreen control interface within a robust aluminum profile frame. It enables repeatable, programmable testing of the mechanical stresses experienced by medical beds during normal use, handling, and patient interaction.

Key Advantages

- **Multi-Function Integrated Testing Platform**

Engineering: Combines dynamic loading (0–1500 N), impact testing (adjustable 0–300 mm height), body-weight simulation (0–1400 N), and stability/pressure loading (0–1300 N) in a single servo-driven system.

Benefit: Reduces equipment footprint and investment while enabling comprehensive mechanical safety and durability evaluation according to multiple clauses of IEC 60601-2-52 and related standards.

- **High-Precision Servo Control & Repeatability**

Engineering: Servo motor + ball screw drive system with PLC control delivers precise force application, height positioning, and programmable cycle counts (up to 99,999 cycles).

Benefit: Ensures highly repeatable and traceable test results, critical for type testing, quality control, and regulatory submissions in the medical device industry.

- **Large Test Capacity for Full-Size Medical Beds**

Engineering: Accommodates test samples up to 3000 × 1800 × 1500 mm with a robust aluminum profile frame and safety features including stroke protection and safety rope design.

Benefit: Enables testing of full-size hospital beds, nursing beds, and rehabilitation beds without compromising on specimen size or safety during instability and dynamic load tests.

- **User-Friendly PLC + Touchscreen Interface**

Engineering: 7-inch color touchscreen with intuitive parameter setting for force, height, cycles, and test module selection, plus real-time monitoring and automatic alarm functions.

Benefit: Simplifies operation for laboratory technicians, reduces training time, and minimizes human error during complex multi-module test sequences.

- **Standards-Aligned Test Modules & Fixtures**

Engineering: Includes standardized loading pad (Ø355 mm), impactor (Ø200 mm, 17 kg body + 25 kg total), and hard foam counterweight models per YY 9706.252-2021 and GB 9706.1-2020 requirements.

Benefit: Ensures direct compliance with specific test clauses, facilitating acceptance of test data by certification bodies and regulatory authorities for medical electrical equipment.

Technical Specifications

3.1 General System Parameters

Parameter	Specification	Remark / Notes
Model	KP-6061C	Medical Bed Load and Impact Test System
Control System	PLC + 7-inch color touchscreen	Intuitive parameter setting and monitoring
Drive System	Servo motor + ball screw	Precise force and position control
Frame Structure	Aluminum profile frame	Robust and modular design
Power Supply	AC 220 V, 50 Hz	Standard laboratory single-phase supply
Equipment Size (W×D×H)	2050 × 1200 × 2100 mm	Compact footprint for lab environments

Max. Test Sample Size	3000 × 1800 × 1500 mm	Suitable for full-size medical beds
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3.2 Test Function Parameters

Test Function	Key Parameters	Notes / Standard Reference
Dynamic Loading from Persons	Force: 0–1500 N; Cycles: 0–99,999	Loading pad Ø355 mm per YY 9706.252-2021 Fig. 201.104
Mattress Support Platform Impact	Height: 0–300 mm (nominal 180 mm); Cycles: 0–99,999	Impactor Ø200 mm, 17 kg body + 25 kg total; Annex CC.2.2
Body-Weight Dynamic Load	Load: 0–1400 N; Height: 0–300 mm; Cycles: 0–9,999	Counterweight + hard foam model per GB 9706.1-2020 9.8.3.3
Stability / Pressure Loading	Force: 0–1300 N; Loading plane: 20 × 20 cm	For instability tests per GB 9706.1-2020 9.4.2.3
Safety Features	Stroke protection + safety rope design	Reduces risk during instability and dynamic tests

Testing Principle

The KP-6061C system applies controlled mechanical loads and impacts to evaluate the strength, durability, and mechanical safety of medical beds under standardized conditions representative of normal use and patient handling:

- 1. Dynamic Loading Module:** A standardized loading pad (Ø355 mm) applies cyclic forces (0–1500 N) to simulate loads from persons sitting, lying, or moving on the bed.
- 2. Impact Module:** A defined impactor (Ø200 mm, total 25 kg) is dropped from adjustable height (nominal 180 mm) onto the mattress support platform to assess structural integrity.
- 3. Body-Weight Simulation:** Counterweights combined with a hard foam model apply dynamic loads (0–1400 N) to replicate human body weight distribution and movement.
- 4. Stability / Pressure Loading:** A 20 × 20 cm loading plane applies controlled force (0–1300 N) to evaluate bed stability and resistance to tipping or deformation.

All modules use servo control for precise, repeatable force application and cycle counting, with built-in safety mechanisms to protect both the equipment and operators during testing.

Typical Applications

- Medical bed manufacturers — Type testing, design validation, and production quality control for hospital beds, nursing beds, and rehabilitation beds
- Third-party testing laboratories — Compliance testing and certification support according to IEC 60601-2-52 and national standards
- R&D and engineering teams — Mechanical safety evaluation and optimization of adjustable bed structures and mattress support platforms
- Quality assurance departments — Incoming inspection and batch verification of bed frames and components
- Regulatory and compliance teams — Generation of test data for technical documentation and market approval submissions

Compliance & Manufacturer

This equipment supports selected test methods from IEC 60601-2-52 (Medical electrical equipment — Particular requirements for the basic safety and essential performance of medical beds), YY 9706.252-2021, and GB 9706.1-2020. It is designed to assist manufacturers and laboratories in evaluating mechanical safety and durability aspects of medical beds.

Note: Full compliance evaluation requires complete application of the relevant standards, including product design, risk management, and laboratory procedures. The system provides test capabilities aligned with specific clauses; final compliance determination remains the responsibility of the manufacturer and accredited testing bodies.

Factory verification of loading, motion, and safety functions is performed before delivery. Optional calibration reports from qualified or CNAS-accredited laboratories are available. Fixture customization and test report adaptation can be provided upon request. Manufactured under ISO 9001, ISO 14001, and ISO 45001 quality management systems.

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