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Building industry leading test platforms to automate sensing and improve measurements by reducing human errors.

BiSi

BioSimulator

The BioSimulator (BiSi) is a precision biomechanical testing system designed to evaluate orthopaedic implants under controlled, multi-axis joint-like motion. It enables realistic simulation of complex implant kinematics while avoiding the cost, size, and sample preparation burden associated with full-scale joint simulators.

At the core of the BiSi is a unique RPY motion stage, capable of generating accurately controlled Roll, Pitch, and Yaw movements. Each rotational axis is independently programmable, allowing users to define oscillation amplitudes and frequencies that closely replicate physiological joint motion.

The BiSi is specifically intended to bridge the gap between simplified material-level tribology tests and full anatomical joint simulators. It allows implant designers and researchers to study wear, stability, and kinematic response under complex motion conditions using compact specimens and streamlined fixturing.

The system is engineered for robustness and repeatability, supporting long-duration tests under constant or cyclic normal load. Its compact footprint and fully electric operation allow installation in standard laboratory environments using only a single-phase power supply.

Features

- Simulates complex joint kinematics using true Roll, Pitch, and Yaw motion
- User-settable oscillation angles in all three rotational axes
- Designed for implant testing under physiologically relevant movement patterns
- Bridges the gap between simplified tribology tests and full joint simulators
- Compact, fully electric system suitable for standard laboratory spaces
- High stiffness and precision motion control for repeatable results
- Designed for long-duration, unattended operation

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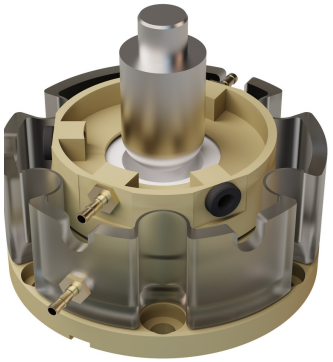
BiSi
Technical Specifications



- Load Range (Fn): Up to 400 N
- Load Style: Static or Dynamic
- Load application: Static or cyclic normal loading
- Degrees of freedom: Three rotational axes (Roll, Pitch, Yaw)
- Control: Independently programmable oscillation per axis
  - Roll motion: ±15 degrees max / frequency: Up to 1 Hz
  - Pitch motion: ±15 degrees max / frequency: Up to 1 Hz
  - Yaw motion: ±15 degrees max / frequency: Up to 1 Hz
- Combined motion: Simultaneous Roll, Pitch, and Yaw with user-defined phase and amplitude
- Data logging: Continuous test data recording with time-based traceability
- Controls: Touchscreen with onboard software
- Software capabilities: Programmable load and motion profiles, real-time monitoring, and error diagnostics

Power Requirements
- Electrical: 110–230 VAC, 50/60 Hz, 1 Ph

Specimen Environment
- Fluid cell
- Temp range: up to 50°C with external control (optional)
- Compatibility: Bovine serum, saline, or synthetic lubricants or custom test fluids

Options
- External temperature controller

Weight & Dimensions
- Net dimensions: 400×260×1000 mm (15.8×10.2×39.4 in)
- Net weight: 50 kg (110 lb)

Continuing R&D may result in specifications, appearance changes