

## KASON HFT2000A-3 Rail and sleeper fatigue testing machine



### Product introduction

The KASON HFT2000A-3 sleeper fatigue loading testing machine is mainly used for static mechanical properties, dynamic mechanical properties and various conventional mechanical performance tests of fastener assemblies, railway sleepers and other products. By replacing fixtures, it can also be applied to conduct tensile, compression, high-cycle, low-cycle and fatigue crack tests and researches on various materials and components.

### Specification

Technical Parameter Name	Technical Parameter Value
Maximum Test Force	Static 2000kN, Dynamic $\pm 1000$ kN
Test Force Indication Accuracy	$\leq \pm 1\%$
Displacement Indication Accuracy	$\leq \pm 1\%$ F.S (Full Scale)
Frequency Range	0.1~10Hz, stepless adjustable
Control Mode	Two control modes: Load and Displacement, mutually switchable
Effective Test Force Measurement Range	2%~100%F.S (No range switching in full scale, equivalent to 4 ranges)
Actuator Piston Stroke	$\pm 50$ mm
Computer Control Function	Automatic zero adjustment and range switching for load via

	computer; range switching for displacement via computer; zero adjustment and range switching for deformation via computer; PID regulation for displacement and load via computer; function generator waveform control; smooth switching between three control modes: Displacement, Load and Deformation
Safety Protection Function	Overload protection, limit protection, fracture protection, fatigue protection, emergency stop
Oil Source Control Mode	Intelligent servo control
Distance Between Columns	1500mm
Power Supply Power	Approx. 150 kW
Operating Noise	≤60dB
Overall Equipment Dimensions (L×W×H)	Approx. 2000×2000×2600mm

### Product Implementation Standards

This series of products meet the relevant test requirements of the following standards:

GB/T 3075-2008 Metallic materials — Fatigue testing — Axial force controlled method

GB/T 228.1-2010 Metallic materials — Tensile testing — Part 1: Method of test at room temperature

GB/T 2611-2007 General technical requirements for testing machines

### Standard accessories

Module Category	Equipment Name	Specification/Configuration	Quantity
Main Unit Section	Loading Frame	-	1 Set
	Load Cell	2000kN/±1000kN	1 Pc
	Displacement Sensor	±50mm	1 Pc
	Actuator	-	1 Set
Intelligent Servo Oil Source	Electro-Hydraulic Servo System	150kw	1 Set
	Oil Tank	-	1 Set
	Oil Filter	Wenzhou Liming	1 Set
	Accumulator	Wenzhou Liming	1 Pc
	Oil Pipes, Pipe Fittings & Seals	Junren	1 Set

	Power Drive System	-	1 Set
Electrical Control Section	Servo Controller	Adopting full digital closed-loop measurement and control system	1 Set
	Electrical Drive & Control Console	-	1 Set
	KASON Fatigue Test Software	-	1 Set
	HP Color Inkjet Printer	-	1 Pc
	Lenovo Computer	Mainstream configuration	1 Pc
	Computer Desk	-	1 Pc

## Structure Introduction

The main body of the testing machine adopts gantry frame structure, and the servo actuator is mounted on the crossbeam. Equipped with intelligent servo loading control system, the hydraulic system can adjust pressure and flow according to different test requirements to realize approximate constant power output. With low energy consumption, little heat is generated during operation, so no cooling device is required.



Schematic Diagram of Servo Actuator

## Servo Actuator

1. Designed and manufactured based on unitized, modular and standardized development concepts, featuring low damping, fast response, long service life and large clearance structure.
2. All sealing parts adopt imported high-speed special seals dedicated for servo actuators.
3. The support structure of the servo linear actuator piston rod abandons traditional design. It adopts non-metallic support and large clearance design with strong lateral force resistance, realizing high-speed anti-seize and self-lubricating performance.
4. Hydraulic buffer zones are set at the limit stroke positions of the actuator stroke to prevent equipment damage caused by out-of-control operation.
5. With special structural design, the actuator can effectively reduce the overall machine height while meeting all test requirements.
6. Starting pressure is less than 0.05 MPa.

## Intelligent Servo Hydraulic Power Unit

The hydraulic power unit of this equipment consists of hydraulic components including intelligent servo pump unit, actuator control valve group, crossbeam control valve group, oil tank, oil filter and hydraulic pipe fittings.



Servo motor pump unit



Schematic Diagram of Intelligent Servo Hydraulic Power Unit



Electrical Control Cabinet & Operation Cabinet for Hydraulic Power Unit

The intelligent servo hydraulic power unit supplies oil at constant working power without needing a cooler. It keeps the whole hydraulic system operating at low temperature, preventing insufficient system pressure and hydraulic leakage caused by temperature rise.

#### Features of Intelligent Servo Hydraulic Power Unit

1. Adopts closed-loop constant pressure control mode. During pressure holding, it reduces motor speed via frequency conversion to greatly cut power consumption, eliminating high-pressure throttling energy loss existing in conventional hydraulic units.
2. PID speed regulation is applied before mechanism locking to reduce actuation impact and extend mechanical service life.
3. System oil temperature drops by 30%~70%, easing ambient temperature rise, slowing down aging of hydraulic components, prolonging oil change cycle and lowering maintenance costs.
4. Low-noise operation below 60dB, effectively controlling on-site working noise.
5. Outstanding energy-saving effect reaches 50%~85% (varies according to equipment operating frequency).

#### **Central Control Console**

The central control console serves as the control, measurement and display device for all test operations. It consists of microcomputer measurement and control system (test force measuring & control unit, displacement measuring unit), electric drive control system, computer data processing system, screen display system and test report printing system.

#### **Grip**

Equipped with one set of pressure plates

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