

RDJ Series Electronic High Temperature Permanent Creep Tester



1. Application:

RDJ-E microcomputer-controlled electronic creep stress rupture testing machine is mainly used for testing the mechanical properties of superalloys, titanium alloys, other ferrous metals and non-ferrous metals, and measuring the steady-state creep rate, creep limit, creep elongation, Permanent fracture time, permanent strength limit, permanent elongation after fracture, section shrinkage, permanent notch sensitivity coefficient. In addition to conventional creep and durability tests, stress relaxation tests, high-temperature short-time tensile tests, cyclic loading tests (load spectrum tests), and low-cycle cycles can also be performed.

2. Test standard:

2.1. Manufacturing and inspection standards

All parts of the testing machine and the measurement units of various instruments all adopt the International Unit (SI) standard.

The design, manufacture, inspection and use of the testing machine comply with national standards and relevant industry standards. The applicable standards are as follows:

JB/T9373 "Technical Conditions for Tensile Creep Testing Machine"

GB/T16491 "Electronic Universal Testing Machine"

GB2611 "General Technical Requirements for Testing Machines"

GB/T16825.2 "Inspection of Force Applied by Tensile Creep Testing Machine"

2.2 Applicable test method standards

GB/T2039 "Metal Tensile Creep and Endurance Test Method"

HB5151 "Test method for high temperature tensile creep of metals"

HB5150 "Test method for high temperature tensile endurance of metals"

ASTM E139 《Conducting Creep, Creep-Rupture, and Stress-Rupture Tests of Metallic Materials1》

ASTM E292 《Standard Test Methods for Conducting Time-for-Rupture Notch

Tension Tests of Materials》;

ASTM E1012 《Standard Practice for Verification of Testing Frame and Specimen

Alignment Under Tensile and Compressive Axial Force Application1》。

3. Technical Parameter

Model	HST RDJ-30E	HST RDJ-50E	HST RDJ-80E	HST RDG-100E
Machine Frame Part				
Maximum test load	30kN	50kN	80kN	100kN
Minimum test load	0.6kN	1kN	1.6kN	2kN
Testing machine Accuracy	$\leq \pm 0.5\%$			
Absolute resolution	1/500000 (the whole resolution remains unchanged)			
Maximum loading rate	3000N/s			
Speed adjustment range	0.001~100mm/min (stepless speed regulation)			

Rate control accuracy	better than $\pm 0.5\%$
Maximum travel of tie rod	200mm
Concentricity	better than 8%
Indication relative error	$\pm 0.1\%$
power supply	220V, 50Hz, 1.0kw
Deformation part	
Consistency over long time of deformation(more than 7000 hours)	$\pm 0.5\%$
Deformation measuring sensor	Grating ruler deformation sensor
Deformation measuring range	0~10mm
Deformation measurement error	$\pm 0.001\text{mm}$
Deformation measurement resolution	0.001mm
High temperature electric furnace and temperature control system	
Electric furnace structure	Split-type atmospheric furnace, resistance wire heating, three-stage temperature control; Resolution $\leq 0.3^{\circ}\text{C}$, error $\leq \pm 1^{\circ}\text{C}$
Operating temperature range	300 $^{\circ}\text{C}$ -1200 $^{\circ}\text{C}$ (long time below 1100 $^{\circ}\text{C}$)
Heating speed	less than 20 $^{\circ}\text{C}/\text{min}$
Temperature fluctuation	200~600: $\pm 2^{\circ}\text{C}$; 600~800: $\pm 3^{\circ}\text{C}$; ≥ 900 : $\pm 3^{\circ}\text{C}$
Effective soaking zone length	150mm
Electric furnace structure size	Inner diameter $\Phi 90\text{mm}$ or $\Phi 110\text{mm}$
Overall dimension	$\Phi 320 \times 450 \text{ mm}$
Electric furnace heating wire	5mm, stable performance
Electric furnace life	Continuous working time at $\leq 1000^{\circ}\text{C}$, more than 50000 hours
Electric furnace surface temperature	$\leq 60^{\circ}\text{C}$ (average)
Power supply	380V $\pm 10\%$; 50Hz $\pm 2\%$
Heating power	Limit 4 KW
Measurement and control test software	
Measuring controller	Each machine has its own 7 "touch-screen measuring controller. Each machine can work either independently or in connection with a computer
Power of a single testing machine	About 7KW
Servo motor power	1 KW
Control system power	0.2 KW
High temperature furnace heating power	4.0 KW
Computer control system power	1KW