

# Servo Hydraulic Universal Testing Machine

Brand: JNG

Model: JG-1000L

Capacity: 1000kN



(For reference only)



Single Test Zone

Side Action Tensile Grip

0.5 Class

### Big Advantages

- Side action grip, higher gripping performance without any initial gripping force.
- Piston moves up and down quickly, save time for continues test.
- Lower test space, it is convenient for operator for specimen installation, high testing efficiency.

### Equipment Usage

- JG-1000L Servo Hydraulic Universal Testing Machine is a single test space on the lower position of load frame, with oil-cylinder mounted on the top position. Due to large and lower test space, quickly loading speed, it makes it more flexible for tensile testing of large strength metal materials, especially suitable for long length specimen, like deformed steel bar, etc. It greatly improves the test efficiency, it is very popular in some big steel and iron manufacturing companies for high testing frequency (like 24 hours daily continuous test).
- It adopts four columns structure, high stiffness. It uses high accuracy load cell to measure testing force, encoder to measure displacement of piston stroke, electric extensometer to measure extension. Close loop control software can auto get test ultimate tensile strength  $R_m$ , yield strength  $R_{eH}$ , max. testing force  $F_m$ , non-proportional extension  $R_{p0.2}$ , T/Y ratio, elongation rate A%, extension at max. testing force  $A_{gt}$ , etc testing results.

### Conform To The Standards

- BS 4449, ASTM A615, ISO6892, ASTM E8, JIS Z2241, etc.

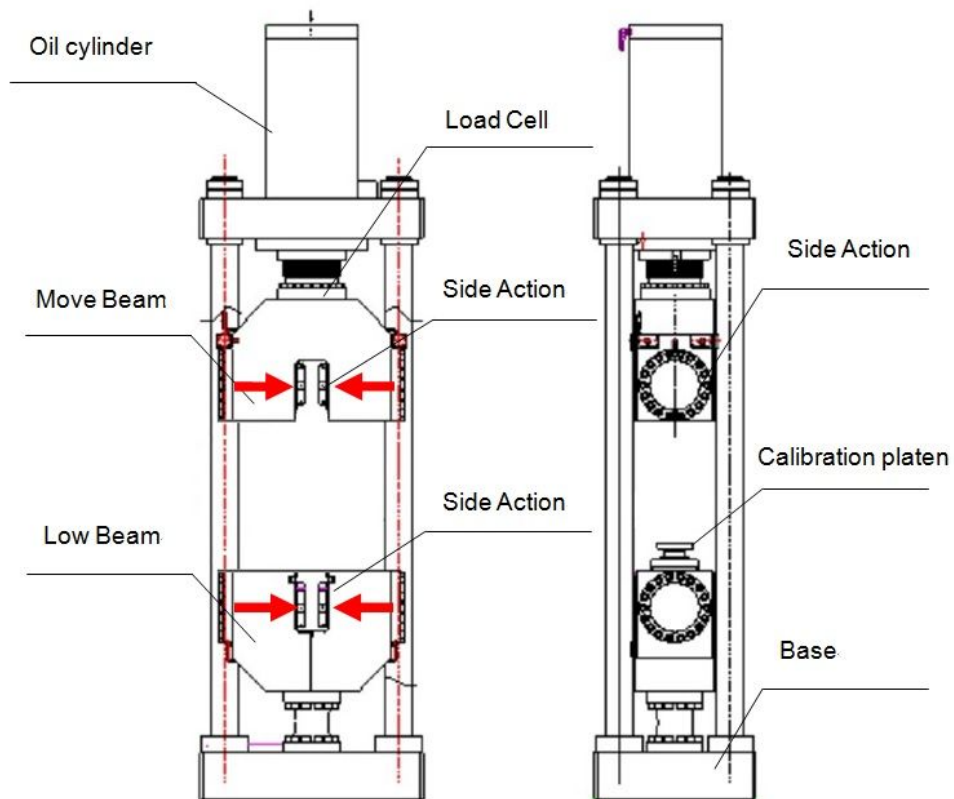


## Technical Specifications

Model	JG-1000L
Max. test force	1000kN
Measurement range of accuracy	1% - 100%
Testing force accuracy	±0.5% of reading value
Control range of stress rate	1 – 60MPa/S
Adjust range of test stress rate	1N/mm <sup>2</sup> S <sup>-1</sup> - 60N/mm <sup>2</sup> S <sup>-1</sup>
Adjust range of test strain rate	0.00025/S – 0.0025/S
Precision of deformation measurement	±0.5%
Precision of displacement measurement	±1%
Control range of displacement rate	0.5mm/min – 200mm/min
Maximum tensile space	650mm
Clamping diameter of rebar	13mm – 60mm
Clamping thickness of flat specimen	0 -40mm
Diameter of upper and lower plate	300 x 450mm
Piston stroke	650mm
Deformation measurement	Extensometer gauge length: 200mm; Extension: 100mm
Power supply	3-Phase 4-Wire, 380V, 50Hz, 5.5kW
Dimension	Host machine: 1080 x 680 x 3500(mm) Power pack: 850 x 1060 x 1220(mm)
Weight	Host machine 6000Kg, Power pack: 800Kg

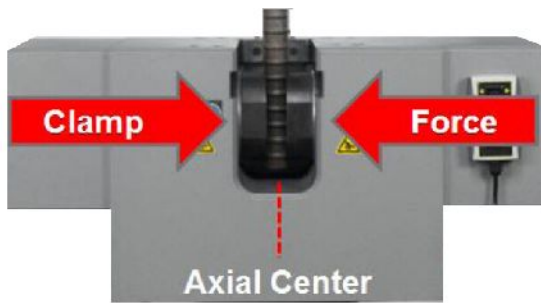


## Structure Of Load Frame



- It adopts 4 columns structure, high stiffness.
- Oil-cylinder is mounted on the top position, the large impact resistance during break test can be well absorbed by the big oil cylinder. It can well protect the whole stiffness of the load frame.
- Bidirectional differential cylinder provides bidirectional control of tension and compression in one single space. 650mm large piston stroke can realize quickly adjust test space. After finish one test, quickly goes back preparing for second test. It improves testing efficiency.
- Guidance of piston rod protects cylinder from lateral force, improve the working life of sealing components.
- Advanced side action hydraulic tensile grips provide high gripping performance for high strength and high hardness materials without any initial gripping force.
- The load cell directly measure the testing force, high accuracy.
- The operator does not need to climb high for install the specimen, it is more convenient to install and remove specimen at the lower single test space. It improves testing efficiency and reduces labor force.
- Half-opened tensile jaw seat improves the whole stiffness, no deformation, long working life.

## Side Action Hydraulic Tensile Grip



- Compared with wedge type hydraulic grip, this side action hydraulic grip has advantage of gripping the sample without any initial gripping force.
- Excellent axial alignment avoids lateral loading.
- Cylinders are inserted inside the grip body; dual direction clamping can ensure good proper alignment regardless of sample thickness varying.
- Piston is made of alloy steel with high hardness and abrasion resistance.
- It equips round tensile jaw and flat tensile jaw for testing material.

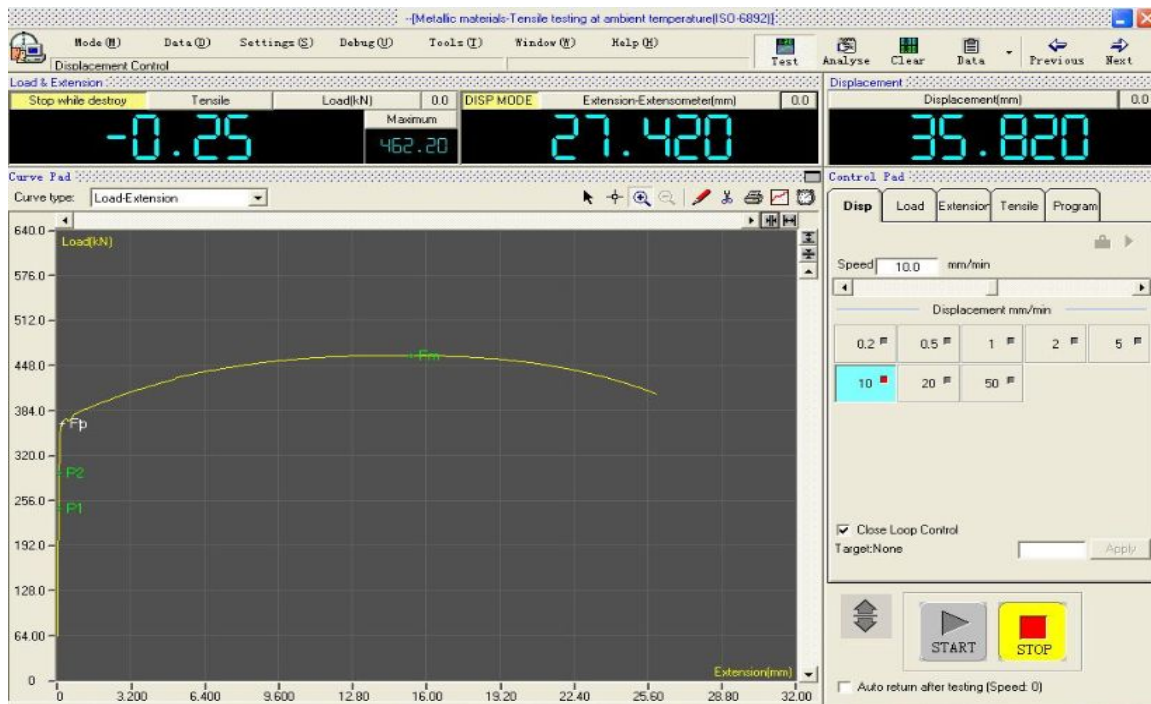


## Power Pack

- The power pack is composed of high quality hydraulic components, like American MOOG servo valve, Japanese NACHI gear pump, low noise. It also included high precision filter, cooling fan, oil temperature gauge, hydraulic clamping pressure gauge, main system pressure gauge, solenoid valves. Especially the cooling system, it enables the long time test and endure high temperature environment. The cooling fan automatically starts when the temperature of hydraulic oil reaches the preset value.



## Functions And Features Of Software



- Human interface testing software: MaxTest, it has a powerful function.
- The software based on Windows system, it supports Windows 2000, Windows XP, Windows 7, Windows 8, etc. It is rich many international testing standards, like ISO, ASTM, JIS, BS, etc.
- The control mode contains constant force, constant displacement, constant deformation and others. The testing process can show curve force-displacement, force-time, force deformation, stress-strain, etc. It can automatically switch at any time, easy to observe and compare.
- New test module: can build a new test by a single or batch of;
- Curve analysis module: The users can analysis the curve after the test. The user can find the every point of curve by the mouse.
- Data inquiry module: The user can quickly find test data they need from the thousands of test data if they know any parameter.
- Overload protection: if the load is 2% - 10% of load sensor max. measuring capacity, the machine will stop automatically.
- The software auto remind taking off extensometer before the specimen broken.
- The testing report can be titled according to the customer's requirement.
- Program control mode is convenient for the customer to create new testing program.

## Electric Extensometer



**Manufacturer:** USA Epsilon Technology Inc. American brand

**Introduction:** Epsilon is the world famous extensometer

For deformed steel bar tensile test: it has 200mm gauge length, 100mm extension measuring range. The extension measuring accuracy is 0.5 class.

Epsilon extensometer was created to survive specimen failure by separating into two halves, thus preventing permanent damage to the module body. During operation, the upper half of the extensometer pulls out of the main body. Tapered measuring beams activate strain gaged flexures within the unit. This unique design allows long measuring ranges, yet retains compatibility with electronics for strain gaged transducers. It offers high accuracy and is light weight but rugged, with low operating force.



### Features:

- Specifically designed to be left on through specimen failure. The unit is designed so that the two halves of the extensometer come apart to prevent damage at specimen failure.
- Standard quick attach kit for quick mounting to specimens
- Hardened tool steel knife edges are easily replaced. A spare set comes with every extensometer.
- Includes high quality foam lined case.
- Replaceable arms and spacers for ease of repair. The optional gauge length spacers allow the gauge length of the extensometer to be easily increased for different testing requirements.
- Standard quick attach kit for quick mounting to specimens.





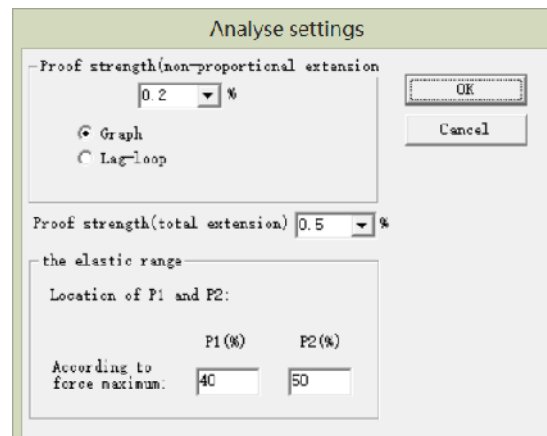
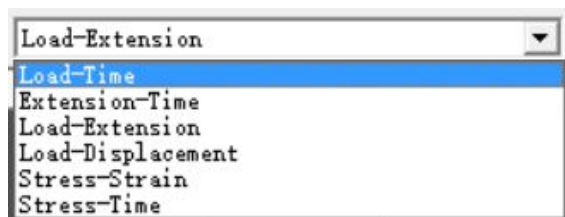
# Tensile Test Curve And Results

The screenshot shows a software interface for a tensile test. At the top, there are three digital displays: 'Load (N)' showing 0.00, 'Extension (mm)' showing 0.0000, and 'Displacement (mm)' showing 0.00. Below these is a graph titled 'Load-Extension' with a yellow curve. To the right of the graph is a 'Data pad' containing sample test results such as 'Sample ID: 001', 'Tensile Data: 018-00-00', 'Grade: B008', 'Type: Circle', 'Nominal Dia: 20', 'Weight: 0.530', 'Length: 0.62', 'Side weight: 0.47', 'Diameter: 15.99', 'Area: 214', 'L<sub>0</sub>: 200', 'L<sub>e</sub>: 100', 'A<sub>0</sub>: 0', 'B<sub>0</sub>: 0.01', 'B<sub>0.2</sub>: 0.02', 'B<sub>0.5</sub>: 0.03', 'B<sub>1</sub>: 0.04', 'B<sub>1.5</sub>: 0.05', 'B<sub>2</sub>: 0.06', 'B<sub>2.5</sub>: 0.07', 'B<sub>3</sub>: 0.08', 'B<sub>3.5</sub>: 0.09', 'B<sub>4</sub>: 0.10', 'B<sub>4.5</sub>: 0.11', 'B<sub>5</sub>: 0.12', 'B<sub>5.5</sub>: 0.13', 'B<sub>6</sub>: 0.14', 'B<sub>6.5</sub>: 0.15', 'B<sub>7</sub>: 0.16', 'B<sub>7.5</sub>: 0.17', 'B<sub>8</sub>: 0.18', 'B<sub>8.5</sub>: 0.19', 'B<sub>9</sub>: 0.20', 'B<sub>9.5</sub>: 0.21', 'B<sub>10</sub>: 0.22', 'TS/YS Ratio: 1.24'. On the far right is a 'Control Pad' with buttons for 'Speed', 'Displacement', 'Load', 'Extension', 'Tensile', and 'Program', along with 'START', 'STOP', and 'RETURN' buttons.

Callouts from the image:

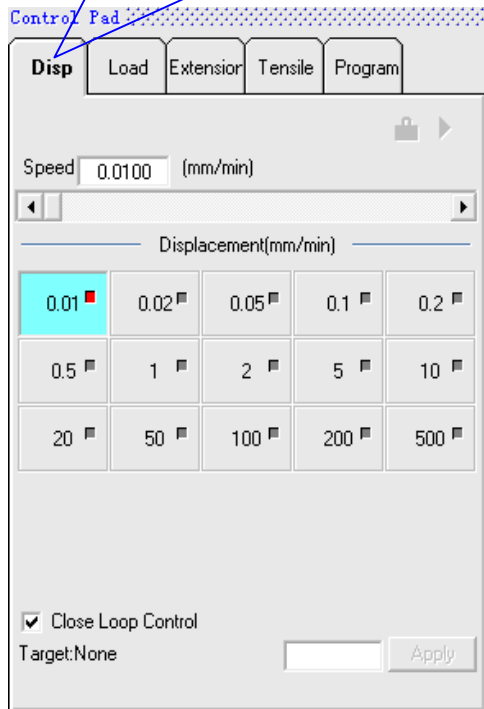
- Load**: Points to the 'Load (N)' display.
- Extension**: Points to the 'Extension (mm)' display.
- Displacement**: Points to the 'Displacement (mm)' display.
- Load- extension curve**: Points to the graph.
- Sample test results**: Points to the 'Data pad'.
- Control mode, like displacement, load, etc.**: Points to the 'Control Pad'.

Other types of curve are also available: Proof strength 0.2%, P1 and P2 are adjustable.

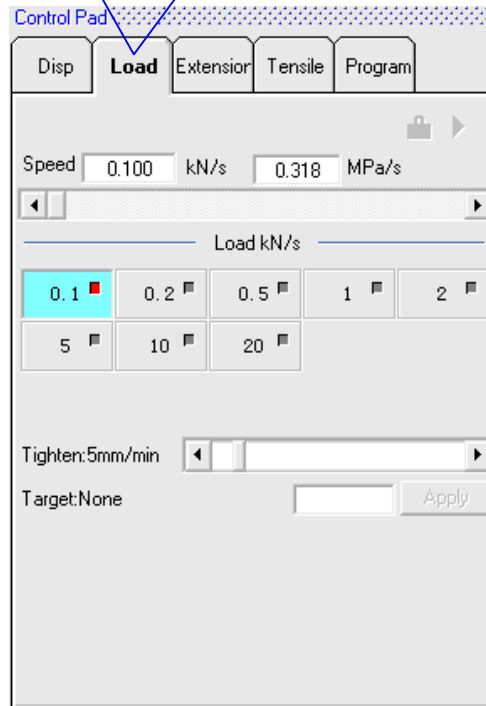




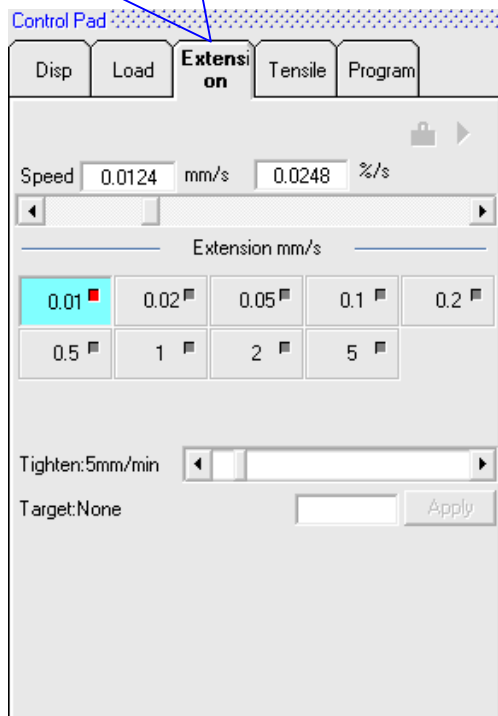
### Displacement control module



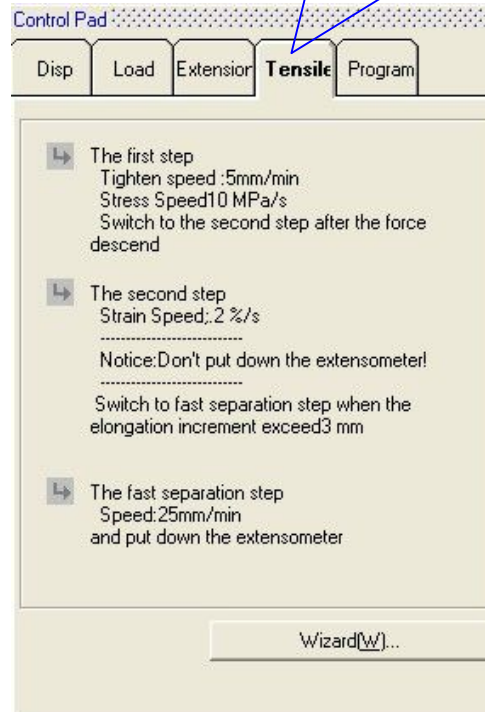
### Load control module



### Extension control module



### Tensile Control module

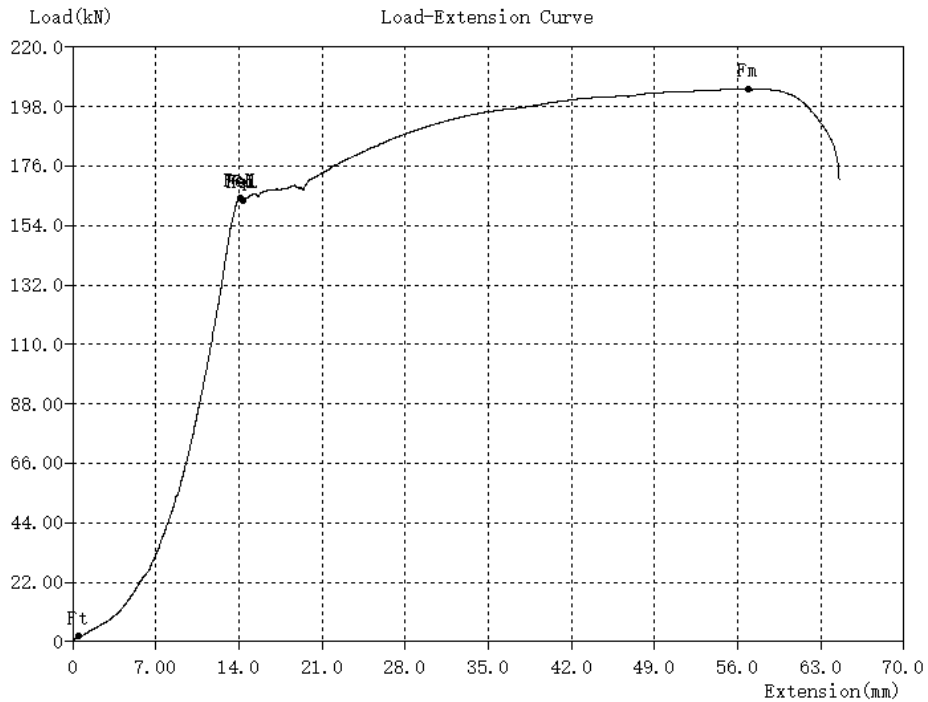


## Tensile Test Report Example












### ABC Steel Company Limited

#### 20mm TMT500W

Sample ID	001	TestDate	2018-08-09
Grade	500W	Type	Circle
Nominal Dia (mm)	20	Area(mm <sup>2</sup> )	314
Gauge length(mm)	200	Elongation after fracture(%)	20.0
Maximum force (kN)	204.4	Tensile strength (MPa)	651
Upper yield force (kN)	164.1	Upper yield strength (MPa)	523
Lower yield force (kN)	163.2	Lower yield strength (MPa)	520
Proof force(kN)	163.2	Proof strength 0.2% (MPa)	520
Total extension at max.force(%)	28	Modulus of elasticity (GPa)	7



## Standard Parts

Description	Remark	Image
Host machine	4-column, Oil-cylinder on the top	
Power pack	High configuration	
Control PC	Dell brand	
Control DSP card and MaxTest software	3 Close Loop Control	
Printer	HP A4 black-color Ink-jet Printer	
Hydraulic Servo Valve	American MOOG	
Extensometer	American Epsilon: GL: 200mm, Range: 100mm	
Tensile Test Accessories	13- 26mm, 26- 40mm, 40- 60mm 0-20mm, 20-40mm	
Compression Test Accessories	Platen size: 300 x 450mm	
Load Cell	American Celtron brand	
Servo Control Box	Servo valve control	
Photoelectric encoder	Japanese Nemicon	