

Microcomputer Controlled Electro-hydraulic Servo Universal Testing Machine

HY-WAW-Series



The WAW-Series UTM adopts four columns and two lead screws, The base is cast in one piece, which is more stable and accurate than the two-column structure in the market.



I. Introduction

HY-WAW-Series type microcomputer-controlled electro-hydraulic servo universal testing machine adopts a cylinder-mounted host, which is mainly used for metal and non-metal tensile, compression and bending tests. It is suitable for metallurgy, construction, light industry, aviation, aerospace, materials, colleges and universities, research institutes and other fields. The test operation and data processing meet the requirements of GB228-2002 "Room temperature material metal tensile test method".

Standard

ASTMA370, ASTM E4, ASTM E8, ASTM E9, ASTM A615, ISO6892, ISO7438, ISO7500-1, ISO 15630 ISO 6934, EN10002-4, GB/T228-2002, GB 16491-2008, HGT3844-2008 QBT 11130-1991, GB13-22-1991, HGT 3849- 2008, GB6349-1986, GB/T 1040.2-2006, ASTM C165, EN826, EN1606, EN1607, EN12430 etc.

II. Program description

1. Host

The main engine adopts an under-cylinder main engine, the tensile space is located above the main engine, and the compression and bending test space is located between the lower beam of the main engine and the workbench.

2. Transmission system

The lifting and lowering of the lower crossbeam adopts a motor driven by a reducer, a chain transmission mechanism, and a screw pair to realize the adjustment of the tension and compression space.

3. Hydraulic system

The hydraulic oil in the oil tank is driven by the motor to drive the high-pressure pump into the oil circuit, flows through the one-way valve, high-pressure oil filter, differential pressure valve group, and servo valve, and enters the oil cylinder. The computer sends a control signal to the servo valve to control the opening and direction of the servo valve, thereby controlling the flow into the cylinder, and realizing the control of constant velocity test force and constant velocity displacement.

4. Control system

4.1 Function introduction

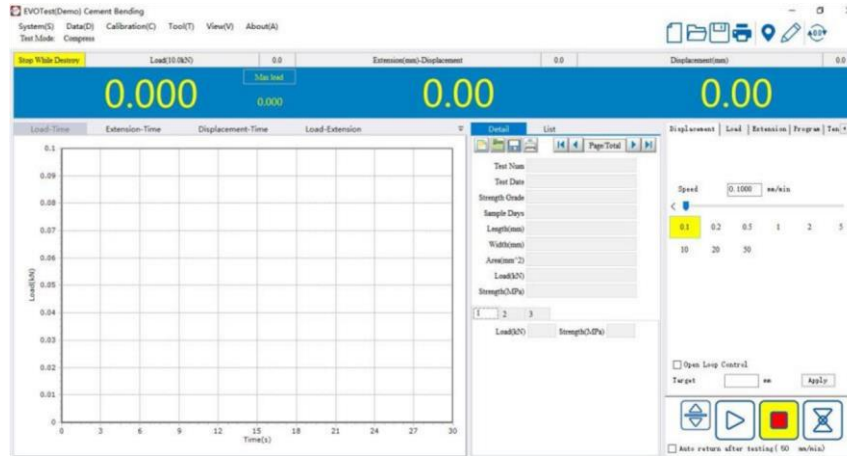
- Support for tensile, compression, shear, bending and other tests;
- Support open editing test, editing standard and editing procedure, and support export and import test, standard and procedure;

- Support customization of test parameters;
- Adopt open EXCEL report form, support user-defined report format;
- It is flexible and convenient to query and print test results, support printing multiple samples, custom sorting and printing items;

- The program comes with powerful test analysis functions;
- The program supports hierarchical management of two levels (administrator, tester) user management authority;

4.2 Software description

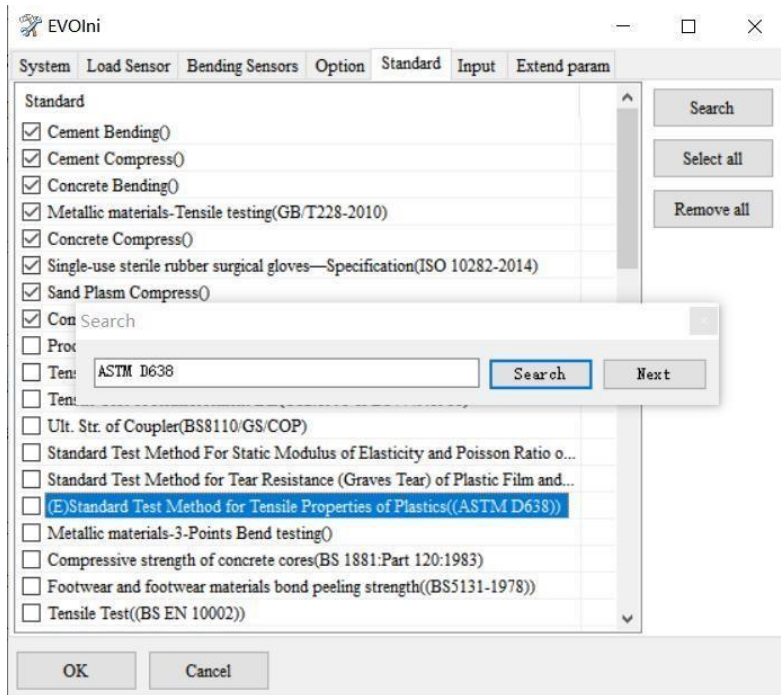
- The main interface integrates multiple functions. The main program interface includes: system menu area, tool bar area, value display panel, speed display panel, test parameter area, test process area, multi-graph curve area, result processing area, and test information area .



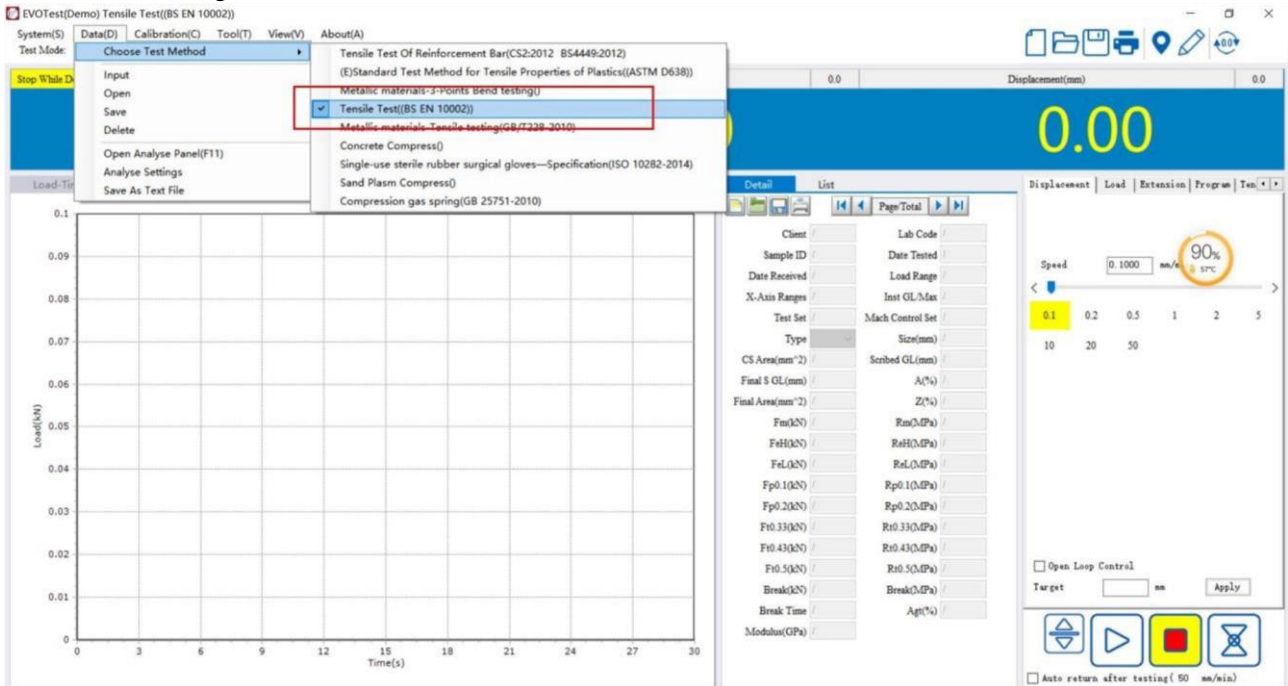
- Curve drawing: The software system provides abundant test curve display. Such as forcedisplacement curve, force-deformation curve, stress-displacement curve, stressdeformation curve, force-time curve, deformation-time curve.

Software details:

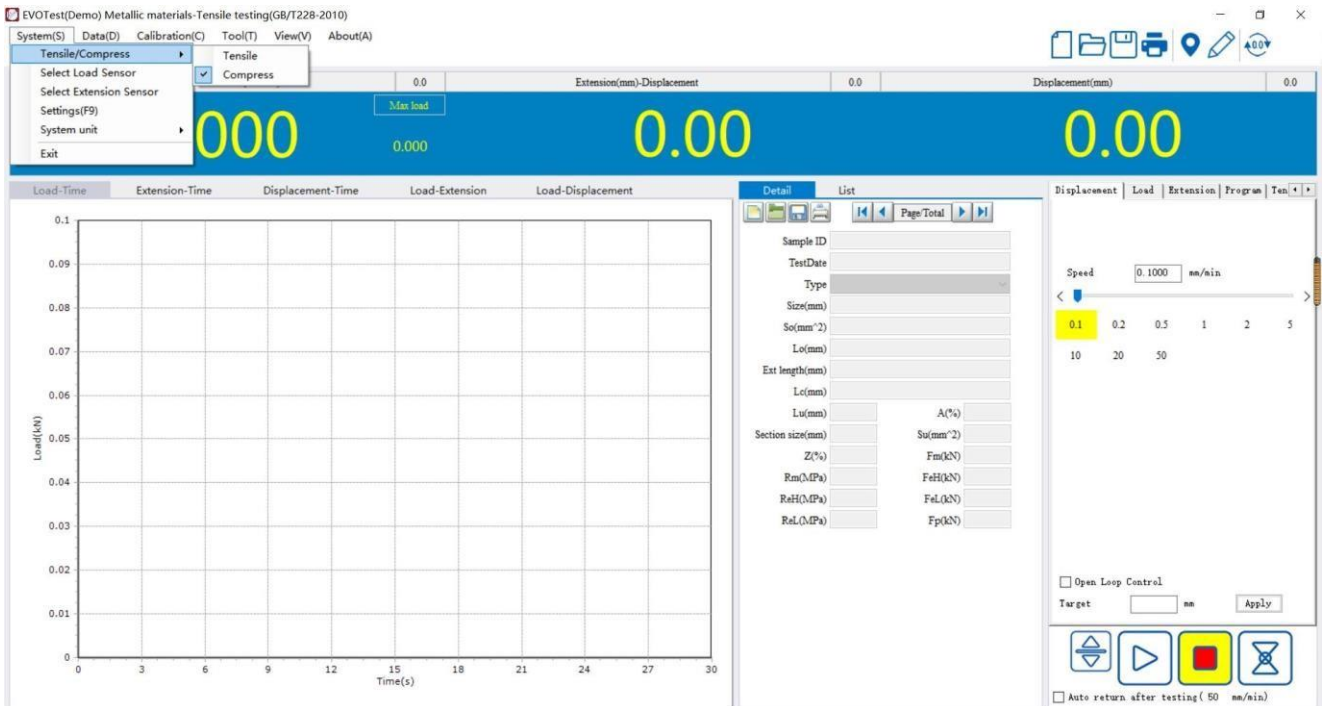
1. Use software tools search and add related testing standard;



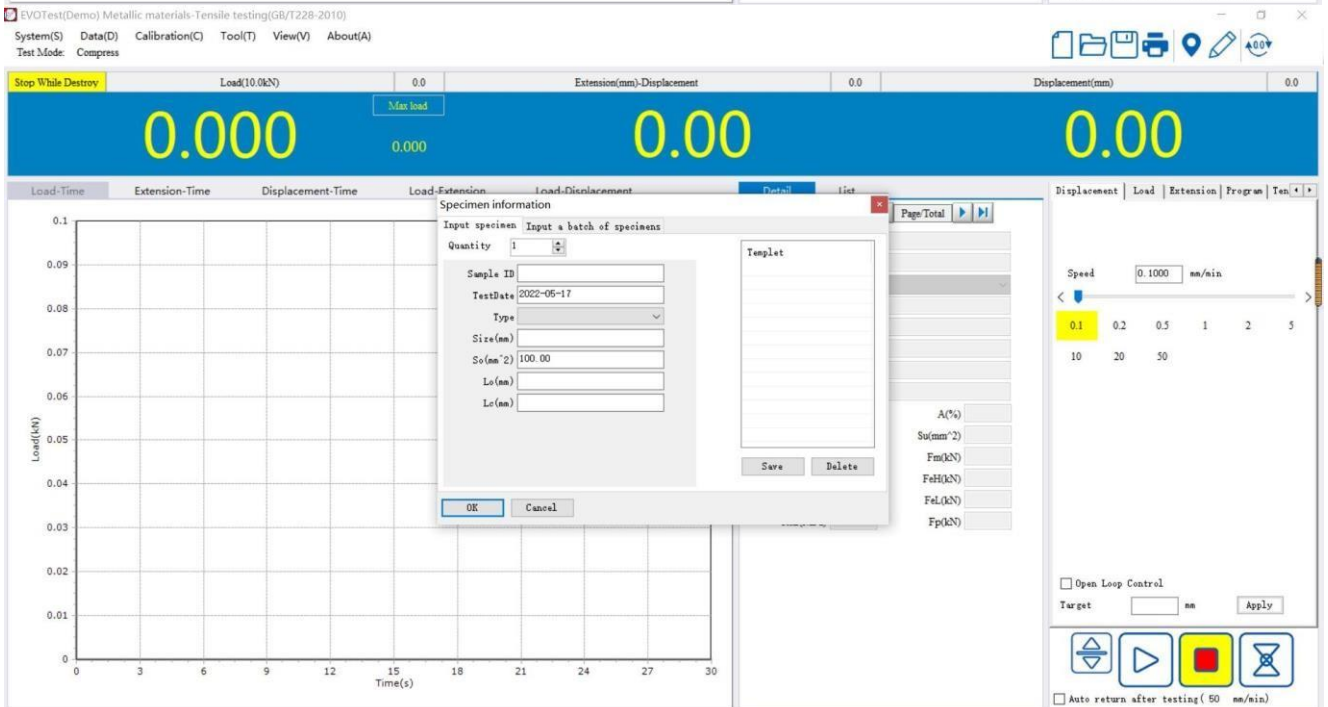
2. Choose the testing standard;



3. Choose the testing function.



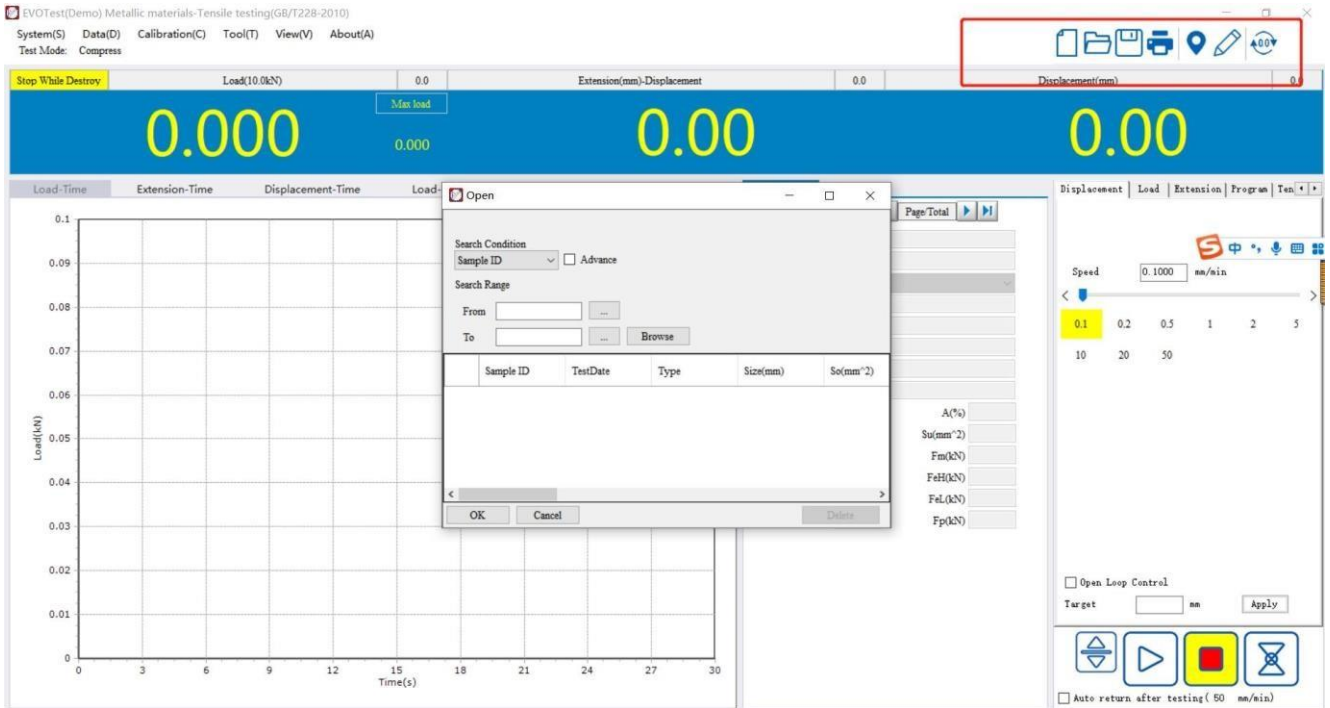
The screenshot shows the EVO Test software interface. At the top, the title bar reads "EVO Test(Demo) Metallic materials-Tensile testing(GB/T228-2010)". The menu bar includes "System(S)", "Data(D)", "Calibration(C)", "Tool(T)", "View(V)", and "About(A)". The "Tensile/Compress" menu is open, showing options: "Tensile", "Compress", "Select Load Sensor", "Select Extension Sensor", "Settings(F9)", "System unit", and "Exit". The main display area features a large blue header with three digital readouts: "000", "0.00", and "0.00". Below this is a graph with "Load(kN)" on the y-axis (0 to 0.1) and "Time(s)" on the x-axis (0 to 30). The graph is currently empty. To the right of the graph is a "Detail" panel with a list of fields for specimen information, including Sample ID, Test Date, Type, Size, So, Lo, Ext length, Lc, Lu, Section size, Z, Rm, ReH, and ReL. Further right is a control panel with a "Speed" dropdown set to "0.1000 mm/min", a "Target" input field, and several control buttons (Home, Play, Stop, Pause). The status bar at the bottom shows "Load(10.0kN)", "Extension(mm)-Displacement", and "Displacement(mm)".



The screenshot shows the EVO Test software interface with the "Specimen information" dialog box open. The dialog box has a title "Specimen information" and a subtitle "Input specimen Input a batch of specimens". It contains the following fields: "Quantity" (set to 1), "Sample ID" (empty), "Test Date" (set to 2022-06-17), "Type" (dropdown menu), "Size(mm)" (empty), "So(mm^2)" (set to 100.00), "Lo(mm)" (empty), and "Lc(mm)" (empty). There is also a "Templet" list and "Save" and "Delete" buttons. The "OK" and "Cancel" buttons are at the bottom. The background shows the same software interface as the previous screenshot, but the graph is still empty. The status bar at the bottom shows "Stop While Destroy", "Load(10.0kN)", "Extension(mm)-Displacement", and "Displacement(mm)".

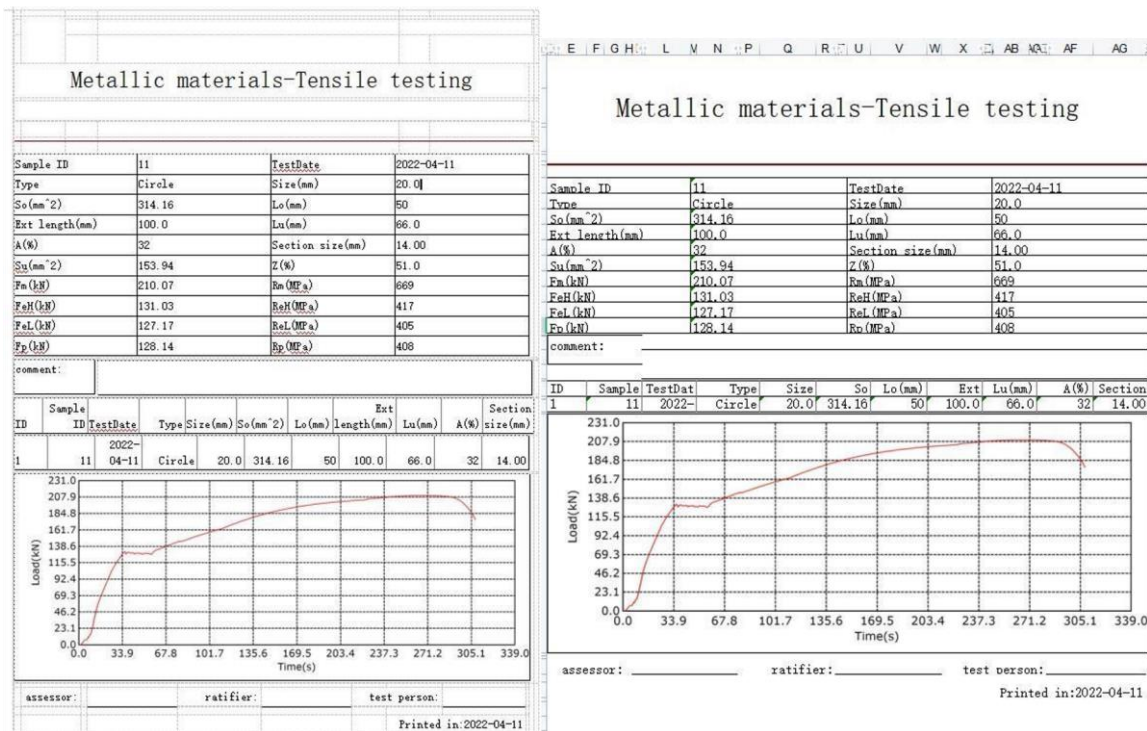
4. Set up the sample details, then test;

5. After testing you can open the test report and print;



The screenshot shows the EVOtest software interface. At the top, there are menu options: System(S), Data(D), Calibration(C), Tool(T), View(V), and About(A). Below the menu is a toolbar with icons for file operations and a red box highlighting a specific set of icons. The main display area shows a graph of Load (kN) vs Time (s) with a blue header bar displaying '0.000' and '0.00'. An 'Open' dialog box is open in the center, allowing search for test reports by Sample ID, Test Date, Type, Size, and Section Size. The right side of the interface features a control panel with a speed slider set to 0.1000 mm/min, a 'Target' field, and various control buttons like 'Apply', 'Play', 'Stop', and 'Auto return after testing'.

6. The test report can be exported excel and word version;



The image shows two versions of a test report for 'Metallic materials-Tensile testing'. The left version is an Excel spreadsheet, and the right version is a Word document. Both reports contain the same data and graphs.

Sample ID	11	TestDate	2022-04-11
Type	Circle	Size(mm)	20.0
So(mm ²)	314.16	Lo(mm)	50
Ext length(mm)	100.0	Lu(mm)	66.0
A(%)	32	Section size(mm)	14.00
Su(mm ²)	153.94	Z(%)	51.0
Fm(kN)	210.07	Rm(MPa)	669
FeH(kN)	131.03	ReH(MPa)	417
FeL(kN)	127.17	ReL(MPa)	405
Fp(kN)	128.14	Rp(MPa)	408

The reports also include a graph of Load (kN) vs Time (s) showing the test curve. The Word report includes fields for 'assessor:', 'ratifier:', and 'test person:', and a 'Printed in: 2022-04-11' timestamp.

III. Main performance and technical indicators

Test machine level -----1

Load sensor -----High accuracy load cell

Model	HY-WAW-300D	HY-WAW-600D	HY-WAW-1000D	HY-WAW-2000D
maximum test force	300kN	600kN	1000kN	2000kN
Test force measurement range	6KN-300kN	12KN-600kN	20KN-1000kN	40KN-2000kN
Test force indication accuracy	±1%	±1%	±1%	±1%
Displacement measurement resolution	0.01mm	0.01mm	0.01mm	0.01mm
Deformation measurement accuracy	±0.5%	±0.5%	±0.5%	±0.5%
Piston maximum moving speed	50mm/min	50mm/min	50mm/min	50mm/min
Maximum tensile test space	580mm	580mm	670mm	850mm
Maximum compression test space	500mm	500mm	600mm	800mm
Flat specimen clamping thickness	0-30mm	0-40mm	0-50mm	0-70mm
Round Specimen Holder Diameter	Φ4-φ32mm	Φ6-φ40mm	Φ13-φ50	Φ10-φ75mm

Platen size	Φ160mm	Φ160mm	Φ200mm	Φ240mm
Bending test stand spacing	450 mm	450 mm	450 mm	450 mm
stick width	140mm	140mm	140mm	160mm
Pivot diameter	φ30mm	φ30mm	Φ40mm	Φ50mm
Piston stroke	200mm	200mm	250mm	250mm
Clamping method	Hydraulic clamping	Hydraulic clamping	Hydraulic clamping	Hydraulic clamping
Dimensions	Host: 750×600×1950m m; Oil Source: 1100×650×870m m	Host: 780×620×2050 mm; Oil Source: 1100×650×870 mm	Host: 910×780×2350 mm; Oil Source: 1100×650×870 mm	Host: 1200×800×3300 mm; Oil Source: 1200×700×930 mm
Total Weight	1500 kg	1600 kg	2600 kg	7500 kg
Noted: Can be customized as customer requirements				

Other

1. Complete equipment along with suitable Hydraulic unit, operation and control unit with programmed controller, electronic extensometer for gauge length 50 mm (min) along with suitable software and computer, component mounting unit jig and fixtures.

2. Specification for the software

Specially designed for tensile under load/stress control and crosshead separation control (by using the displacement transducer supplied with the machine), allowing:

-Simultaneous display of stress/time, stress/elongation %, elongation/time and stress/elongation; possibility to overlap two elongation/stress graphs: one obtained with the included displacement transducer measuring crosshead separation travel and the other obtained with an optional extensometer (coaxial or universal);

-Elaboration of tension test results : ReH, ReL or Rp (calculated at three different elongation percentages selectable by the ser), A, Ag, At, Agt, Ae, Rt, Z, Elastic modulus E, etc, conforming to EN ISO 6892-1 and EN 15630-1 for steel rebars.

IV. HY-WAW-series hydraulic universal testing machine configuration:

No	Name	Qty
1	Host	1 set
2	Main motor	1 set
3	Base	1 set
4	Hard chrome plated column	4 pcs
5	High precision lead screw	2 set
6	Upper beam	1 set
7	Lower beam	1 set
8	Workbench	1 pc
9	Main cylinder	1 set
10	Hydraulic clamping cylinder	2 set
11	sensor	1 set
12	Hand control box	1 set
13	Control oil source	1 set
14	Hydraulic fixture	1 set
15	Electro-hydraulic servo valve	1 set
16	Oil pump	1 set
17	Oil pump motor	1 set
18	Control System	1 set
19	Electrical control system	1 set

20	Operation cabinet		1 set
21	Electronic Extensometer, this is option		1 set
22	Encoder		1 pc
23	computer		1 set
24	printer		1 set
25	software		1 set
26	Random tools, random files		1 set
27	Standard accessories	Standard accessories 1. Wedgeshaped extension accessories	Choose 2 sets as free
		Compression attachment	1 set

V. Equipment features:

The machine base QT500 has the characteristics of good shock absorption, strong stability and no deformation.

The independent internal clamping cylinder has good sealing performance and durability, and the clamping sample has the characteristics of good synchronization, strong support center and convenient maintenance.

The four-column support has the characteristics of uniform support points, uniform force area, high strength, good stability in tensile and compression tests, strong centering of the tensile specimen, high precision, long life and so on.

VI. Acceptance, installation and training: customers need to prepare 46# hydraulic oil before machine commissioning

(a) After the equipment arrives at the buyer, the buyer completes the installation and installation under the guidance of the supplier's technical personnel, and the supplier is responsible. The supplier is responsible for guiding the wiring, debugging and other work of the equipment. After the equipment acceptance is completed, the relevant users will be trained so that the operators can

operate and use the equipment independently, so that the trained person can master the operation, adjustment and basic troubleshooting of the test bench.

(b) Acceptance standard: According to the agreement and national standard as the basis for acceptance.

VII. Quality assurance:

After the equipment is formally inspected and accepted by the ordering party, it will be regarded as formal delivery. The equipment warranty period is 1 year from the date of official delivery. During the warranty period, the supplier shall provide timely and free maintenance services for all types of equipment failures. For all kinds of parts damage caused by non-human, timely and free replacement. If the equipment fails during use during the warranty period, the supplier shall provide timely service to the orderer and actively assist the orderer to complete the maintenance task.

VIII. Confidentiality of technical information and information:

This technical plan belongs to our company's technical information, and the user shall bear the confidentiality obligation for the technical information and information provided by us. This clause is valid for a long time regardless of whether this plan is adopted or not;

We also undertake confidentiality obligations for the technical information and information provided by users.