

Computer Controlled Electronic - Hydraulic Servo Horizontal Tensile Testing Machine

Model: T0015-350

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instruments

The computer controlled electro-hydraulic servo horizontal testing machine is a kind of special high-precision testing equipment which is suitable for the tensile test, break test, cyclic test, proof load, elongation measurement of chain, rope, steel wire rope and electric fittings. The equipment can realize automatic operation, and the test can be completed automatically by computer software. The equipment uses load sensor and spherical centering device, and then consists of thrust cylinder, frame, lifting platform, etc. The equipment is driven by special power hydraulic source, electro-hydraulic servo control technology, computer data acquisition and processing, which can realize full-automatic closed-loop control. The equipment is composed of test host, oil source system (hydraulic power source), measurement and control system, electrical system, etc.



The main machine adopts horizontal frame structure, the stroke of oil cylinder is 2000mm, and the maximum testing space is 9000mm. The two beams with tensile fixture, fixed beam and thrust beam are precision processed with steel plate. The truss is welded with thick steel plate and processed on horizontal machining center. All auxiliary tools are finished after heat treatment of alloy steel. The overall design bearing capacity of frame structure is 5000kn, which ensures the precision, stability and reliability of the testing machine.

The adjustment of tensile test space is realized by moving the remote beam back and forth. For electric remote control, the beam movement can be controlled by close micro motion to make the positioning more accurate. At the same time, there is no need for manual pushing, which is fast and labor-saving. The two ends of the bolt are inserted vertically into the guide rail and the remote crossbeam by manual assistance. The operation of the bolt realizes the beam positioning and completes the space adjustment of the testing machine. It is very convenient to adjust the step distance of 500mm.

The high-precision load sensor used in the main engine has high comprehensive accuracy, high sensitivity and good repeatability. After random calibration, the test will not be affected by external force, which can ensure the accuracy of the test process and parameters. Calibration and calibration are simple and convenient.

The machine design has been fully considered in terms of beauty, convenience and safety. For example: the test space adjustment is convenient and fast; the special fixture clamping is reliable; all parts of the testing machine are strictly antirust treated, and the surface of the pull rod is plated with hard chromium, polished and rustproof, so as to ensure the quality and beauty of the equipment, so as to satisfy the customers.



Hydraulic Power System

The integrated oil source cabinet is composed of hydraulic pump station, oil source control, host control and computer host, which is convenient for operation, maintenance, protection and transportation. Computer, display screen and printer can be placed in the integrated measurement and control cabinet, with neat layout and space saving. The maximum working pressure of oil source system can reach 25MPa and 30MPa respectively.

The oil cylinder adopts the bi-directional control oil cylinder with multi-channel sealing, and the main force of the oil cylinder is the jacking force. The cylinder barrel and piston are made of high strength wear-resistant materials, which will not deform, wear and leak for a long time. High quality imported sealing ring, wear ring and dust ring are selected as sealing elements.

The power source adopts imported high-pressure gear pump to ensure stable system pressure and stable oil cylinder operation during long-term use. Energy saving, reliability, safety and environmental protection are fully considered in the system design. The oil source system adopts the components that meet the requirements of environmental protection.

The whole system adopts servo closed-loop control, high response servo valve, motor torque and speed stability, directional valve, differential valve, one-way valve, differential valve, etc, The valve core has fast response and high sensitivity, so it has good tracking, follow-up, adjustable and other functional characteristics. Under the control of high-performance measurement and control system, accurate closed-loop control is realized to ensure the test speed. It is a hydraulic servo control system with the most advanced technology, the best quality and the most high-grade configuration in the domestic testing machine.

The system is equipped with high-density hydraulic oil filtering system to ensure the cleanliness of medium oil under any conditions, and better ensure the optimal functional state of each hydraulic valve and servo valve

The pressure self-protection function of hydraulic system ensures the potential danger caused by accidents, with high safety and reliability of human and machine

Controlling System

The force measuring element of the product is a high-precision load sensor, and the displacement measuring element is a high-precision pull-out displacement sensor. Load sensor, displacement sensor, all digital closed-loop control system and computer plus servo hydraulic system constitute a closed-loop measurement control operating system. Therefore, various test procedures can be set and selected, the test process can be automatically and accurately controlled, and the test parameters of each stage can be measured automatically, which ensures the high precision of the test.



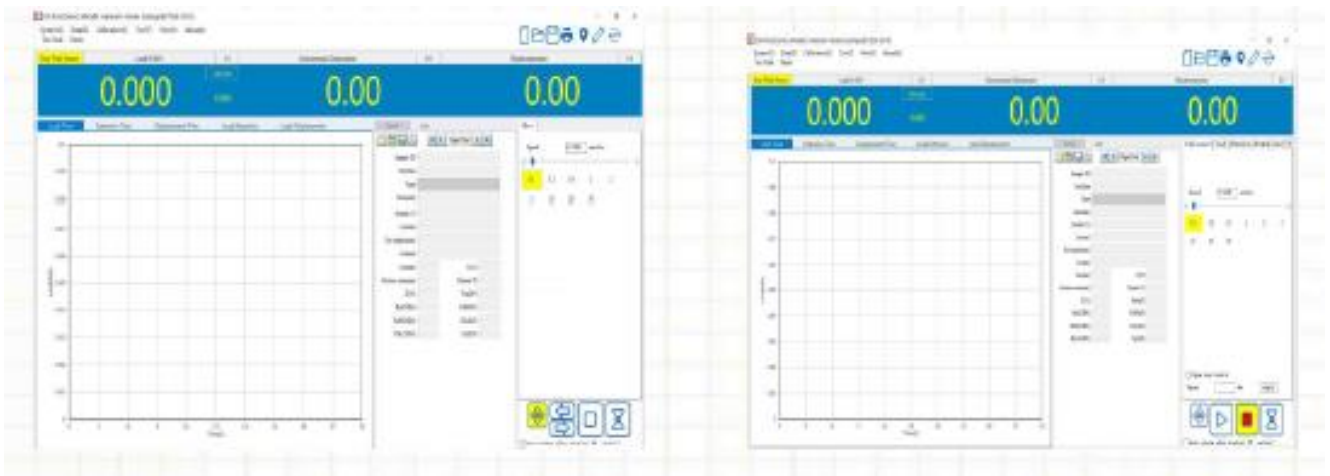
The special test software installed and used is developed under the windows platform to ensure the test operation is simple and universal, the processing, storage and transmission of test data are easy and convenient, and the test process curve is displayed on the display in real time.

The system can realize long-time continuous and fast loading, holding and unloading, constant speed loading, long-time holding load, constant speed unloading, constant speed displacement and other closed-loop control.

The force and displacement can be controlled by sections in one test, and the control can be switched smoothly. The test parameters can be collected by computer and processed by software, and the test process can be controlled automatically and the test results can be obtained automatically. The test curves and results are displayed on the computer screen in real time, and the test reports and curves are printed by the printer.

The test software can be set and completed according to the test methods and standards specified by ISO and ASTM, or set and complete the test in advance according to the test methods and standards provided by customers according to the requirements of customers. The test data can be connected with the network through the data interface, and the network interface can be set in advance according to the user's requirements in the software, and the user can be assisted in networking work. it can be used in windows 10

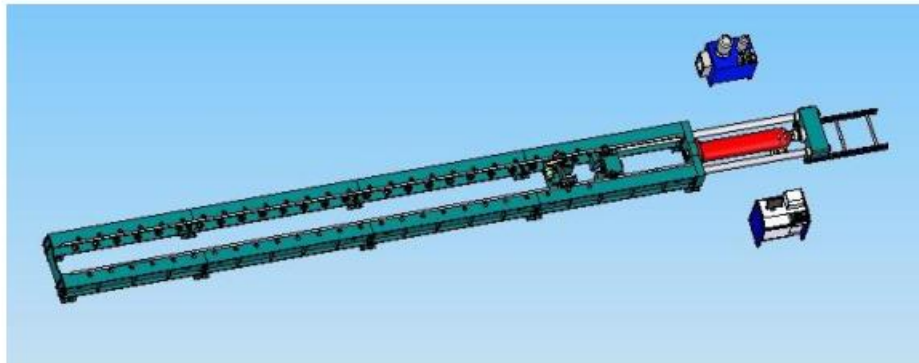
There are also limit protection devices, such as leakage protection, cut-off protection device, limit switch, emergency stop button, etc.



Main Structure Introduction:

Host System (as graph 1):

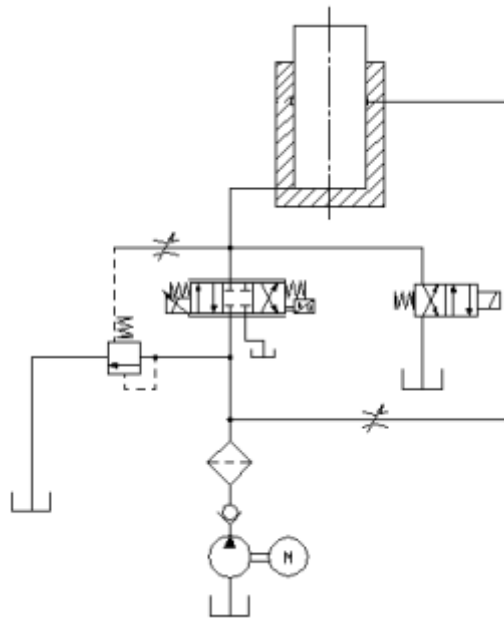
Host machine consists of hydro-cylinder stand, hydro-cylinder piston, shifting cross-beam, fixed cross-beam and load cell.



(Graph 1)

Hydraulic power system:

Hydraulic power system is comprised of four parts: oil pump generator system, electric system, piping system and oil tank (including valve bank and supporting facility).



Controlling, measuring and display system:

1. Adopt hydraulic testing machine specially used proportion servo valve to control load of test force, operate easily.
2. Computer controls load keeping of test force.
3. Precision Load cell measures test force.
4. Computer screen displays test data, drawing test force VS time, force VS displacement curves, curves automatically switches to data for process.
5. Have whole file operation and data reserving functions, test data is finished in ASCII code format, easy for secondary digital process.
6. Test report can be printed.
7. Have completed safety protection device.
8. When test force over 2%-5% of maximal test force of each grade, overload protection automatically turns on, system unloads.
9. When displacement of piston reaches limit, stroke protects, oil pump generator stops.



Technical Proposal:

Host machine

1. Rack use integrated steel plate welded frame structure; main structure is comprised of front and back Clamp, oil tank and front beam.
2. Manually push back clamp stand to regulate testing space
3. Outline is designed as requirement of horizontal testing equipment; make the machine be steady, safe and artistic.

Loading structure: 4000kN Hydraulic Pump loading

1. Single action piston and double-direction structure is made as precise processing technique.
2. Adopt imported SPGO-HBTS seal component to ensure low damp between piston and cylinder.
3. Use load cell measure axial test force, have high precise displacement measurement with encoder.
4. The top of piston rod installed ball and socket bearing and flange plate connect it with load cell.

Back Clamp Stand Displacement Measure Device

1. Back clamp stand is pushed manually to regulate testing space easily.
2. Displacement of back grip stand is driven by movement of sustain dolly at lead rail.
3. Testing space range: 500~7000mm.

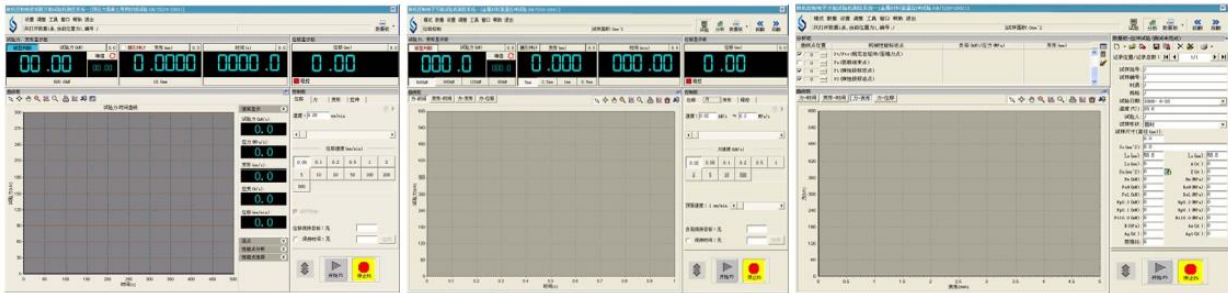
Hydraulic Pump Package

1. One set 10L/min, 30MPa constant pressure pump.
 - used in 4000kN loading system
 - use well-known brand motor, imported low noise, high pressure gear pump.
2. Motor is equipped with vibration damper (vibration reduction pad) to reduce vibration and noise.
3. Oil tank: whole sealing standard oil tank, 80L with oil temperature gauge, oil level indicator, precise press filter and gas filter, additionally have oil temperature, oil level and oil resistance protection and indication device. Oil filter also can be equipped as requirement of real condition.
4. Strong current controlling system: operation and control console use desk structure, placed in testing and operating area, have special operation panel make operation easily. It will stop automatically or alarm for over-limit oil temperature, filter blocked and over-low oil level.
5. Pipeline system: master cylinder loading, hydraulic pipeline of grip actuator is connected with high-pressure hose.



Control system

1. Double-channel DSP control card use full digitalized circuit, with the same structure, improved interchangeability of each channel.
2. Computer Screen control and display show data and test curve.
3. Have complete data saving, historical data and picture representation function.



Specifications:

Max test force	3500kN
Measuring range of testing force	70~3500kN
Accuracy of testing force	± 1% accordance with ASTM E4
Resolution of testing force	1/500000 of maximum force and no subsection of all scale
Testing space	500-9000mm (can be adjustable.adjust step distance is 500mm)
Max piston stroke	2000mm
Displacement measuring range	1500mm
The maximum no-load speed	200mm/min
Testing speed	5mm/min -100mm/min

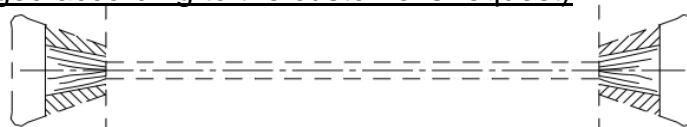
Clamp fixture

The Universal type can be used to realize various clamping modes by changing different tooling. For example: pouring type tooling, used for wire rope and cable; pin type tooling, used for various ropes, belts, etc.

The special tooling of anchor chains can also be customized according to actual requirements.

Features: flexible use, wide range of applications.

The universal type is equipped with a pouring type tooling and a pin type tooling as standard accessories. (can be changed according to the customer's request)





Standard Parts of the LAW Series:

Description	Remarks	QTY
Host system		
Precision Servo Hydraulic Cylinder 3500kN		1 piece
Cylinder seat		1 piece
Movable cross-beam		1 piece
Front and back clamp stand		1 piece
Main frame	with steel plate welded structure	1 piece
Compression sphere plates	data calibration used	1 set
Hydraulic power system		
High pressure pumps	10l/min, 30MPa	1 piece
Well-known brand motor		1 piece
Oil tank	80L	1 piece
High-pressure filters		1 piece
The proportion servo valve, safety valve		1 piece
Electromagnetic relief valve		1 piece
Pressure gauge		1 piece
Air filter		1 piece
Level gauge		1 piece
Computer control system		
Five-channel program-controlled digital amplifier module		
All kinds of AD, ID module		1 set
Windows 2000/XP set of industrial control software		1 set
Load sensor		1 piece
Displacement sensor		1 piece
Control system		
Lenovo Business Machines		1 piece
17 LCD Monitor		1 piece
HP inkjet printer		1 piece
Pipe system		1 set
Operation Cabinet		1 set