WANCE®
Do Our Best for Your Test

Servo-hydraulic Universal Testing Machine | HUT Type D

Description

Featuring a simple and compact structure, high rigidity, and user-friendly operation, this system is suitable for a variety of tests including tensile tests on metal bars and plates, tensile tests on rebars, as well as tension, bending, and compression tests on high-strength bolts, high-hardness metallic materials, metals, and concrete. It offers three control modes—load, deformation, and displacement—with smooth switching between them, enabling constant rate load control, constant rate deformation control, and constant rate displacement control.

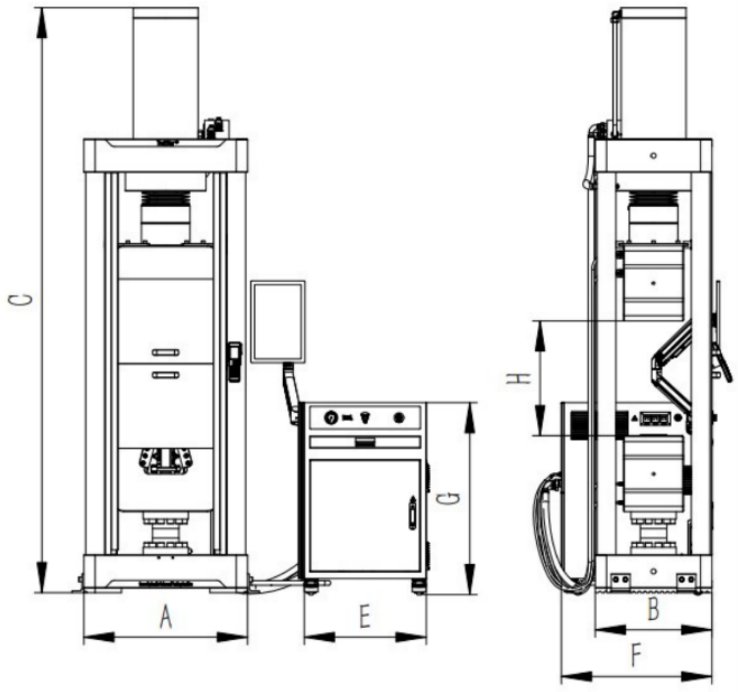
The testing software automatically collects and processes test data, displaying real-time data and multiple test curves such as stress-strain, load-deformation, and load-time curves. It also supports multi-specimen comparison curves and dual-Y-axis test curves, facilitating in-depth analysis. Users can save, export, and print customized test reports and data as needed.

Load Frame Configuration: 4 columns, servo-controlled hydraulic
Capacity: 300kN, 600kN, 1000kN, 2000kN
Test Space: Single zone
Typical specimens: Fasteners, rebar, chain, welds, castings

Parameters

Model	HUT305D	HUT605D	HUT106D	HUT206D
Capacity (kN)	300	600	1000	2000
Accuracy class	Class 0.5			
Load accuracy	±0.5% of reading down to 1% of load cell capacity			
Load resolution	1/600000FS			
Loading rate	0.02%-2%FS/s			
Position accuracy	±0.5% or 0.13mm, whichever is greater			
Position resolution	0.004			
Strain accuracy	± 0.5% of reading down to 2% of full range to ASTM E83 class B-1, B-2 or ISO 9513 class 0.5 extensometer			
Strain resolution	±1/600000FS			
Stiffness (kN/mm)	520	700	950	1820
Up speed (mm/min)	630	340	625	305
Down speed (mm/min)	450	710	1400	650
Distance between columns (mm)	520×390	550x370	650x400	650x400
Distance between tensile grips (mm), H	500	500	600	780
Maximum compression space (mm)	320	300	395	500
Round specimen (mm)	Φ5 ~ Φ12 Φ12 ~ Φ22	Φ5 ~ Φ12 Φ12 ~ Φ22 Φ22 ~ Φ32	Φ5 ~ Φ12 Φ12 ~ Φ22 Φ22 ~ Φ32	Φ5 ~ Φ12 Φ12 ~ Φ22 Φ22 ~ Φ32

			Φ32 ~ Φ40	Φ32 ~ Φ50
Flat specimen (mm)	2 ~ 13 13 ~ 25	2 ~ 16 16 ~ 30	2 ~ 25, 25 ~ 50	10 ~ 40 40 ~ 70
Compression platen (mm)	Φ150	Φ150	200x200	Φ240
Piston travel (mm)	500	500	600	600
Power consumption	4.5kW	4.5kW	12.5kW	
Power supply	3-phase, 380V±10%,50Hz			
Machine size (mm) AxBxC	600x470x2470	730x550x2700	870x620x3110	1100x800x4055
Machine weight (kg)	1100	2000	4200	8500
HPU size (mm) ExFxG	650x800x1010			
HPU weight (kg)	260			
HPU oil	#46 hydraulic oil, 108 liter			



Higher stiffness

New design of frame with higher axial and lateral stiffness comparing with previous design.

Model	Previous	New	Increased
HUT305D	370kN/mm	520kN/mm	140%
HUT605D	580kN/mm	700kN/mm	120%
HUT106D	770kN/mm	950kN/mm	123%
HUT206D	970kN/mm	1820kN/mm	188%

Faster and higher efficiency

The servo hydraulic universal testing system significantly enhances no-load operating speed during tests by increasing oil flow and optimizing the hydraulic pipeline system, thereby improving customer productivity. Designed with ergonomics in mind, the testing height of the electro-hydraulic universal testing system is aligned with the human body. Compared to the previous generation, tests can be conducted without the need to climb stairs. The computer and testing system are integrated into a unit with easily adjustable height and angle, compressing the operating radius to a golden working circle of 0.5 meters. Operators no longer need to move back and forth between the computer and the testing system, saving time and improving work efficiency.

The new intelligent control system comes standard with a high-definition, all-in-one touch industrial computer. Paired with WANCE's latest TestPilot V3.0 testing machine software, it enables direct initiation of tests via the handheld control box. Upon test completion, the crossbeam can automatically return or can be returned by directly pressing a button on the handheld control box, readying the system for the next test. This significantly enhances testing efficiency and operational convenience, providing efficient and energy-saving technical support for high-intensity, high-frequency testing scenarios.

Model	Position speed	Unit	Previous	New
HUT305D	Max. test speed	mm/min	340	430
	Maximum up speed		340	630
	Max. return speed		1000	450
HUT605D	Max. test speed		280	230
	Maximum up speed		280	340
	Max. return speed		660	710
HUT106D	Max. test speed		240	540
	Maximum up speed		240	625
	Max. return speed		375	1400
HUT206D	Max. test speed		195	260
	Maximum up speed		195	305
	Max. return speed		310	650

Smarter

Four primary colors that comply with the IEC 60073 standard allow visual interaction of the machine status by identifying different colors and modes.

Status	Light strip color	Light mode
Power ON		ON
Servo OFF		2-direction flow
Servo ON		ON
Servo ON > 60 second		Flash
Alarm (limit, overload)		ON
Move up		Flow upward
Move down		Flow downward
Hold		ON

High Efficiency, Energy Saving, and Space Conservation

The new series adopts servo motor-driven oil pump technology, significantly reducing operational noise and energy consumption during testing. The compact design minimizes the equipment's footprint. We offer two computer configuration options: an all-in-one touch computer and a non-touch computer. Both options eliminate the need for an additional computer desk. Particularly for large-tonnage models, more units can be accommodated within the same laboratory space, thereby achieving the goal of space conservation, as illustrated in the table below:

Parameters	Previous	New	Reduced
Noise (dB)	70	55	20%
Consumption (6 tests, kWh）	0.327	0.145	60%
300kN occupied space (m^2)	1.36	1.24	9%
600kN occupied space (m^2)	1.55	1.34	14%
1000kN occupied space (m^2)	1.65	1.51	8%
2000kN occupied space (m^2)	2.31	1.64	29%

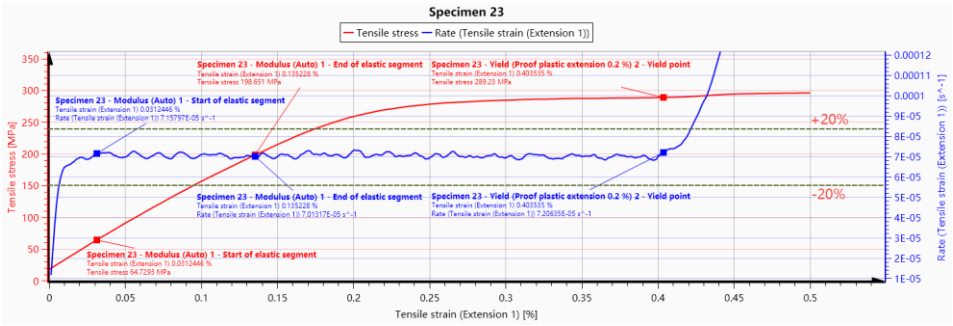
Hydraulic power unit

The HPU adopts advanced design concepts and new hybrid electric power technology. It regulates the flow of hydraulic oil by controlling the rotational speed of the pump through servo motors, thereby controlling the lifting and loading speed of the hydraulic cylinders. This product has a zero pressure and zero noise system when not in operation; it generates almost no noise during operation, has extremely low heat generation, and does not require additional cooling facilities. The design concept has eliminated the problem of high working noise. The structure is compact, reducing a large number of valve components, thereby also reducing the failure rate; the product also has the characteristics of easy maintenance and easy upkeep.

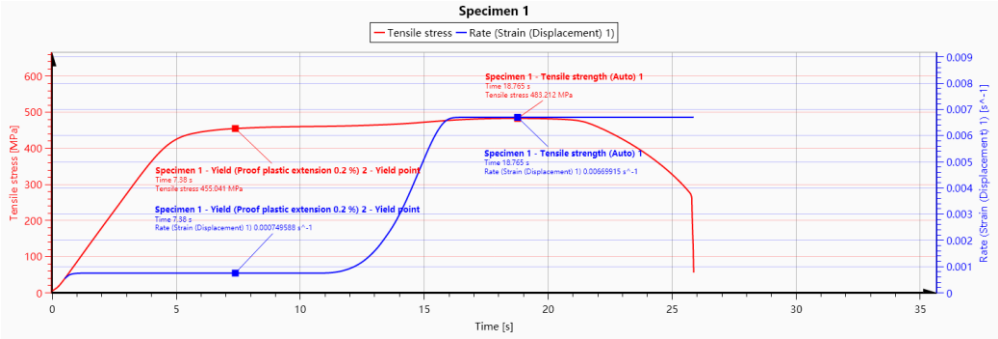
- High-pressure gear pump: It uses a well-known brand high-pressure gear pump, which has the advantages of high pressure, high stability, and low noise.
- Servo motor is adopted to reduce hydraulic components and valve components, making installation and maintenance convenient and quick.
- Pressure overload protection function: When the pressure exceeds the rated pressure of the system, the relief valve will start to overflow to ensure the safety of the entire system.
- Sealing method: The hydraulic pipelines from the oil pipe to the connector all use imported well-known brand products. The pipeline uses a high-pressure flexible hose socketed conical surface sealing connector, which has a good sealing effect and can be disassembled and assembled multiple times.

Controller

- **Excellent control performance**: The improved closed-loop control algorithm is matched with the upgraded transmission system, which shortens the system response time and enables the equipment to provide excellent control performance under various working conditions. Precise speed control and a reasonable smooth switching strategy fully meet the requirements of tests on metals at normal temperature and high temperature.

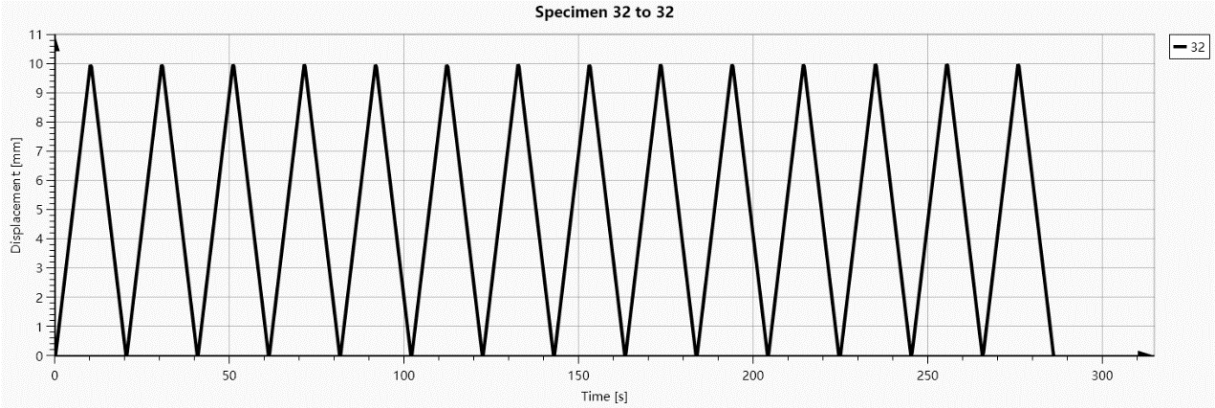


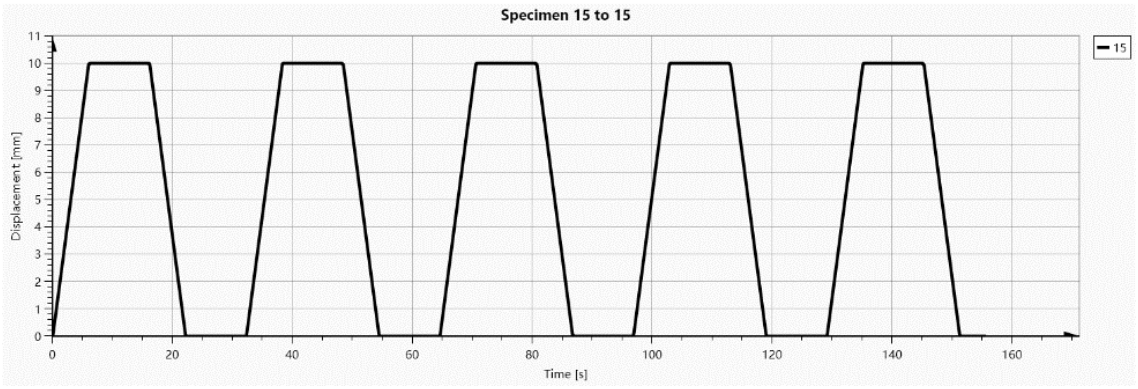
High temperature tensile strain speed: 0.00007/s

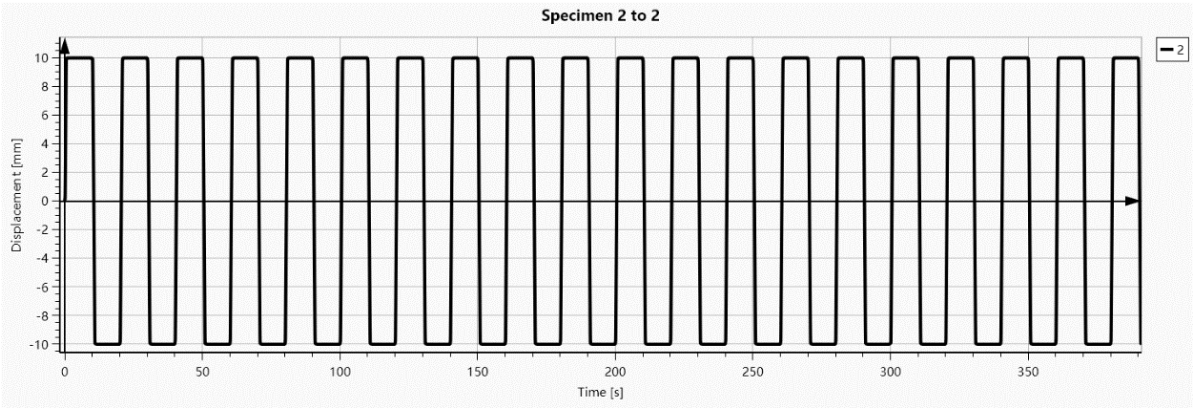


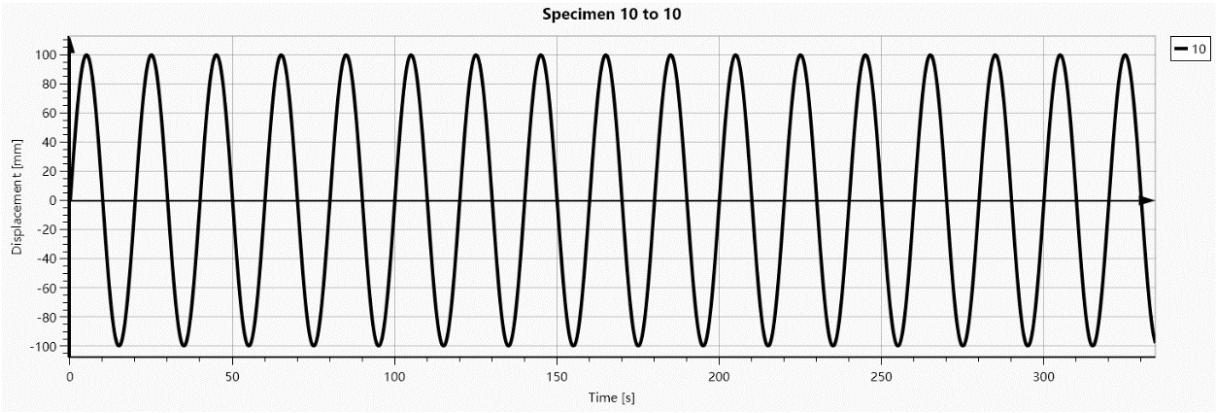
Tensile test smooth switch between different control

- **Waveform generation**: able to generate waveform control, like sine waves and trapezoidal waves.









- **TEDS function**: transducer self-identification system, interface features can be set online by software, system structure is more reasonable;
- **Analogue signal output:** optional BNC outputs enable output any two transducer signals to other data acquisition system, ±10V voltage.
- **Better safety**: With the integrated collision protection function, the system closely monitors the abnormal changes in the force value. When an abnormality occurs, it will immediately stop the movement of the crosshead, which can greatly reduce the damage to the equipment and samples caused by wrong operations and incorrect settings.
- **Ethernet/USB communication** is supported, and the transmission rate is greatly increased to support higher sampling frequency. Ethernet interface adopts special high-performance Ethernet interface chip and hardware logic gate circuit to realize complex TCP/IP protocol cluster, which has significant advantages such as high reliability and good security;
- Four-layer PCB layout, anti-resistance, high reliability;
- Connector with locking function, strong and durable, not easy to fall off, the interface layout is neat

and reasonable, easy to plug and unplug;

- 6-channel 24-bit AD measurement channel;
- Up to 1200Hz sampling frequency;
- Up to 1200Hz closed loop control frequency;
- 20-bit resolution digital input;
- 3-channel high-speed digital acquisition, which is used to collect orthogonal pulse signals such as photoelectric encoder and grating ruler, with the highest signal acquisition frequency up to 4MHZ;

Handset

The HandsetV3.0 handset is equipped with a 3.5-inch touch color screen and silicone buttons, featuring a delicate texture and easy to hold. With the function of fine-tuning the crosshead through the wheel, it can accurately achieve precise adjustment of small displacements and small force values. At the same time, it supports dual-mode communication, namely direct connection to the controller and communication with PC software, providing flexible and efficient compatibility. The magnetic handset makes it more convenient to store and attach to the bracket, taking into account both operation efficiency and space management, and fully meeting the needs of high-precision testing scenarios.

- 3.5” touch screen can display force, position and status
- Fine tuning with wheel
- Grip open and close control
- Specimen protection
- Test on / stop
- Crosshead up / down
- Return to initial position
- Remember initial position

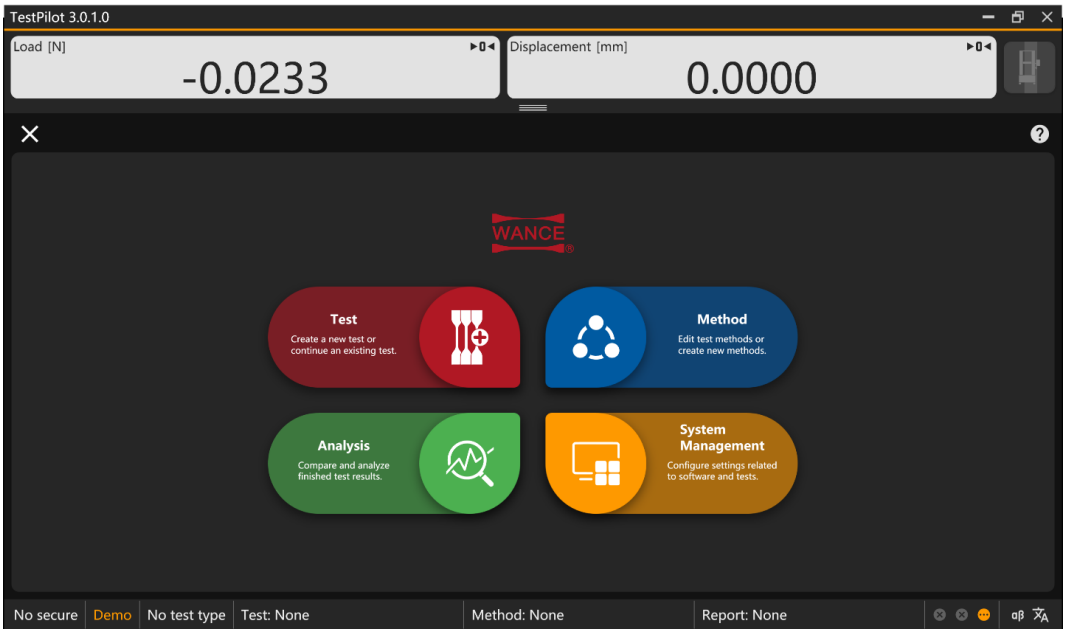
Optional touch screen computer

With advanced ergonomic design, the entire ETM system is equipped with high-definition integrated touch screen computer as optional. The TestPilot V3.0 testing machine software independently developed by us is built-in. The control panel is highly integrated with the testing system, and the operation radius is compressed to a golden working circle of 0.5 meters. Operators do not need to move back and forth between the computer and the testing system, which saves time and improves work efficiency.

TestPilot Universal software

Newly designed test software with simple layout: Simple and clear, with a reasonable arrangement of functions, a well-organized structure, and a unified style. It supports both horizontal and vertical screen display, and the software resolution adapts automatically according to the computer screen. The software has a large pre-installed library of test methods, including the most commonly used standards such as GB/T, ASTM, ISO and EN. These methods are packaged in different test modules according to specific test applications, meeting the test requirements of various industries. Users can customize test standards and

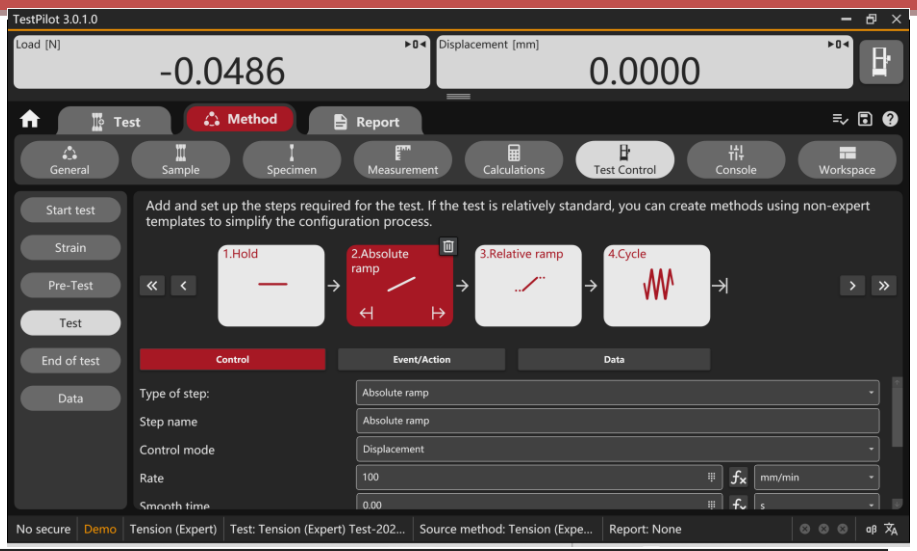
plans. The modular accessory management system organically combines the display and actions of accessory information with the test process. It can be connected to a variety of accessories, such as video extensometers, temperature controllers, dial indicators, fully automatic extensometers, high and low temperature chambers, pneumatic controllers, strain gauges, etc.

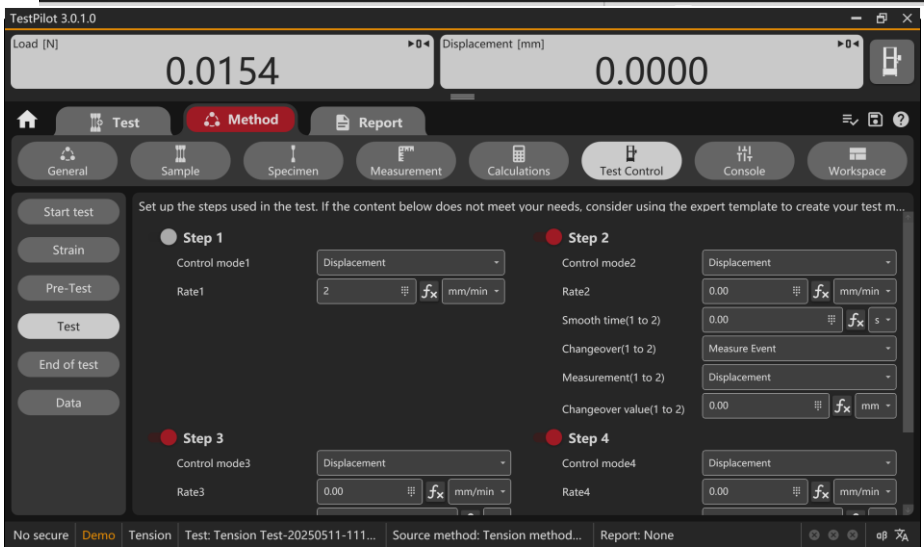


- **Interface Design**: Using a simple and flat interface design style, it conforms to modern software design concepts, creating a simple, grand visual effect and a sense of high-end quality for users. At the same time, the font display is optimized, significantly improving the user's reading experience.
- **Layout and Touch Optimization**: It supports the adaptive horizontal and vertical screen layouts and is compatible with a variety of display devices. For touch input, a numeric keypad is added to optimize the touch input experience and ensure operational convenience.
- **Demonstration Mode**: After the test is completed, it supports generating simulation test files for offline operation of simulation tests.
- **Recalculation**: After the test is over, the test parameters can be modified and the results can be recalculated.
- **Test Standards**: The software has a large number of built-in test methods and can meet the requirements of common standards such as GB/T standards, ASTM standards, ISO standards and EN standards.
- **Method list**: The test methods and test processes are intuitively displayed, and classification and keyword filtering functions are provided to help users quickly locate the required content.
- **Quick Test Method**: A minimalist configuration process has been designed for users, enabling them to complete tensile and compression tests with the fewest steps.
- **Data Export**: After the test is completed, it supports one-click export of raw data to ensure the convenience of data acquisition.
- **Test Progress Visualization**: each test step is highlighted during executing, and total running time, control mode, control rate, and the number of cycles in real time, allowing users to have a clear understanding of the test progress.
- **Test Graph**: The graph supports multiple interaction methods such as keyboard, mouse and touch, and operations such as positioning, zooming, and panning of the global or single coordinate axis can be performed. It supports adding auxiliary lines, dual Y-axes, logarithmic coordinate axes, and allows

users to customize the default boundaries of the coordinate axes, fully meeting users' complex needs for curve analysis and comparison.

- **Function Key Customization**: According to the requirements of the current test method, it supports customizing the function key panel to help users control the test efficiently.
- **Test Log Recording**: Key node step parameter information, event information, action information, and abnormal alarm information during the test process are recorded throughout the process, providing a basis for users to view the test process and analyze the causes of abnormalities.
- **Pre-test Parameter Verification**: Through a strict parameter rationality verification mechanism, abnormal states are eliminated before the test starts, avoiding test failures or sample waste caused by improper parameter settings.
- **Sample Protection Mechanism**: The force is automatically released during the clamping process to prevent sample damage. At the same time, users are allowed to customize sample protection parameters to meet different test requirements.
- **Real-time Data Display**: It supports the real-time display of all measurement channels and calculation results, with a maximum of 12 channels that can be added. Users can freely adjust the layout, switch units, set decimal places and refresh intervals. The currently controlled channel is highlighted, and the time channel supports display in the format of "hour:minute:second", fully meeting customers' customized requirements for channel sampling display.
- **Multifunctional Operation Panel**: Integrates all manual control functions of the controller and accessories, providing users with a quick operation interface for the equipment and accessories.
- **Basic Templates**: Four standard templates for simplifying the test process configuration are provided to help new users quickly get started and complete the test method configuration. Experienced users can use the expert template for flexible configuration to achieve customized design of complex test control processes.
- **Unit System**: The international unit system and the imperial unit system are built-in, and users are supported to customize units to meet special test requirements. Users can switch the unit system of the method and the test with one click to ensure operational convenience.
- **Expression Generator**: It supports constructing custom functions using a set of variables in the method, which can be used to detect test events, define user calculations, virtual measurements, or calculation domains, helping users create complex calculation logic efficiently and intuitively.
- **Measurement Function**: It supports using all accessory channels as physical measurement channels, collecting data in real time during the test and drawing curves. Virtual measurements can be defined through expressions, and the expression variables can be other measured values or user input parameters to meet the needs of complex measurement channels. For measurements that support rate units, users can add associated rate measurements as needed.
- **Calculation Function**: Multiple commonly used algorithms are preset, and relevant parameter configurations are opened to help users quickly configure result calculations.
- **Rounding Function**: It supports configuring multiple rounding rules, and users can directly select them in the result settings to ensure the standardization of data processing.
- **Test Control**: Diverse step modes such as absolute ramp, relative ramp, hold, zeroing, and waveforms (sine wave, square wave, triangular wave) are provided, and actions such as step switching triggered by events are supported. Users can also set acquisition strategies for different steps to meet advanced customization requirements.





- **Voice Broadcasting Function**: Voice broadcasting can be executed before the test, when removing the extensometer, and at the end of the test. The broadcasting content can be customized to enhance the user's operation experience.
- **Accessory Connection**: It can be connected to a variety of accessories, such as dial indicators, fully automatic extensometers, video extensometers, high and low temperature chambers, etc.
- **Accessory Action Control**: It supports interspersing accessory actions at various stages of the test process to help users flexibly control accessory actions.
- **Data Acquisition Strategy:** For all measurement channels, users can customize the data acquisition interval to avoid missing the sudden change parts of the measurement data due to a single rule.
- Automatic Fixture Pressure Setting: It supports the automatic setting function of the fixture pressure. After the fixture exceeds the threshold value, the clamping percentage is synchronously increased according to the change of the maximum force to prevent the sample from slipping during the test.
- **Test Report**: It supports customization functions such as text watermark marking, and at the same time supports saving the report template in a file format, making it convenient for users to configure and reuse.
- **Multi-language Switching**: It supports one-click language switching without restarting the software, ensuring that users have a smooth operation experience in a multi-language environment.
- **Data Analysis**: Cross-scheme and cross-test data comparison: It supports comparison and analysis of

data from different test schemes and different tests, helping users deeply explore the value of the data.

- **Maintenance Reminder**: When the software is started, it automatically reminds users according to the preset maintenance rules, helping users to carry out equipment maintenance in a timely manner and improving the safety and service life of the equipment.
- **Permission Configuration Management**: It supports permission allocation according to user roles, effectively preventing accidental modification of test methods and system configurations, and ensuring the stability of system operation.
- **Safety Performance**: All-round protection measures: It has a powerful safety protection mechanism, covering safety prompts for test method loading, global measurement limit protection, preloading over-travel and overtime protection, sensor range protection, test suspension/termination after the protective door is opened, sample protection over-travel protection, etc., providing all-round protection for the safety of the test process.