TORONTECH

30KN UTM - UNIVERSAL TESTING MACHINE TTM-30

30kN UTM - Universal Testing Machine TTM-30 is designed for analyzing the static properties of materials through tests such as tensile, compression, bending, shearing, peeling, tearing, loading, relaxation, and reciprocating assessments. It supports both metal and non-metal materials, including composites.

The system automatically calculates key parameters like ReH, ReL, Rp0.2, Fm, Rt0.5, Rt0.6, Rt0.65, Rt0.7, Rm, and E. It conducts tests and generates data in compliance with ISO, ASTM, and DIN standards.

APPLICATIONS

1. Calibration of load measurement instruments for uniaxial testing machines
2. Verification and calibration of force-measuring systems in tension/compression machines
3. Tensile testing of metallic materials at room temperature
4. Tensile property determination for plastics
5. Test methods for ceramic tile adhesives

FEATURES

Mechanical Framework and Design

The main frame features a door-frame structure consisting of a base, two fixed beams, a movable crosshead, four columns, and two screws.

The transmission loading system uses an AC servo motor and a synchronous cog belt speed reducer, driving a high-precision ball screw to move the crosshead for precise loading.

Key features include:

1. Sleek and durable design
2. Excellent stability and rigidity
3. High control accuracy and efficiency
4. Low noise operation
5. Energy-saving and eco-friendly performance

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Mark	A	B	C	D	E	F	G	H	I
Value (mm)	1822	790	594	248	576	440	1237	410	190

Control and Measurement System

This machine features the advanced DSC-10TT full-digital closed-loop control system for precise control and measurement. A computer manages the testing process, providing real-time dynamic display of testing curves and data.

After testing, the curve can be enlarged for reanalysis and data editing using the built-in graphical processing module. The system delivers internationally advanced performance for high-precision testing.

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1. Advanced Closed-Loop Control – Enables precise displacement, deformation, and speed control, allowing flexible adjustments to testing speed and methods for enhanced versatility.

2. Multi-Layer Protection – Integrated software and hardware safeguards provide overload, overcurrent, overpressure, undervoltage, overspeed, and limit protection, ensuring safe operation.
3. High-Resolution Data Processing – Three high-speed 24-bit A/D switching channels achieve an effective resolution of ±1/300,000, maintaining consistent accuracy throughout testing.
4. Reliable Data Transmission – Utilizes USB or serial communication for stable, interference-resistant data transfer.
5. Advanced Signal Processing – Incorporates three pulse signal capture channels and quadruple frequency technology, increasing signal resolution and supporting a maximum capture frequency of 5MHz.
6. Precision Digital Drive – Features a servo motor digital-driven signal with a PWM output frequency range from 0.01Hz to 5MHz for precise motor control.

Key Benefits of the Control and Measurement System

1. Next-Generation Control System

The DSC-10TT full-digital closed-loop control system is our latest innovation, specifically designed for testing machines. It incorporates state-of-the-art servo motor control chips and a multi-channel data processing module, ensuring high-speed, synchronized sampling and precise control. The system design relies heavily on hardware modules, enhancing stability and reliability.

2. High-Performance Control Platform

Built on a DSP+MCU architecture, DSC-TT combines the high-speed computation of DSP with the powerful I/O control of MCU, delivering superior performance over standalone DSP or 32-bit microcontrollers. Integrated hardware modules, such as PWM and QEI, ensure stable and safe system operation.

3. Parallel Hardware-Based Sampling

A key feature is its use of a dedicated ASIC chip for synchronous load cells signal sampling. This innovation eliminates asynchronous loading and deformation errors, providing more accurate and reliable test data.

4. Position Pulse Signal Filtering

The optical encoder position capture module features a built-in 24-stage filter, preventing incorrect readings caused by signal interference. This enhances position accuracy and ensures the stability of the pulse capture system.

5. Optimized Control Function Execution

By offloading sampling, condition monitoring, and communication tasks to specialized ASIC chips, DSC-TT focuses on real-time PID calculations for faster response times. This architecture enables rock-bottom control panel processing, ensuring precise closed-loop control at the system’s core.

Performance Characteristics of DSC-10TT

The user interface is designed for Windows systems, offering real-time curve display and processing with a graphical, modular structure for an intuitive experience. Data storage and processing are managed through an MS-ACCESS database, ensuring seamless integration with Microsoft Office for efficient data management and reporting.

The system features a graded user authority management mode, where users access specific functions based on their permissions. The super administrator has full control, managing user access and assigning operation modules accordingly.

It offers a comprehensive testing management function, allowing users to define testing units and customize test programs according to various standards. The system executes tests based on selected programs, generates standard-compliant reports, and displays real-time testing processes, including equipment status, program steps, and extensometer switching.

The curve analysis function supports multiple curve types, such as load-deformation and load-time, displaying one or more curves in real time with color differentiation. Users can traverse, zoom in on, and analyze specific curve segments while labeling feature points automatically or manually for comparison. These labeled curves can be printed in test reports.

Test data is automatically stored, preventing data loss due to system failures. The fuzzy query function allows quick retrieval of test results based on various conditions, enabling redisplay, comparison, and analysis of test data across different test programs, times, and batches. The data backup function ensures previously stored data remains accessible.

The DSC-10TT software is based on an MS-ACCESS database, allowing seamless integration with Microsoft Office and the ability to store reports in Word or Excel format. Users can access raw data directly through the database for in-depth material research and efficient measurement analysis.

With automatic result calculation, the system, along with an extensometer, can determine ReH, ReL, Rp0.2, Fm, Rt0.5, Rt0.6, Rt0.65, Rt0.7, Rm, E, and other test parameters. Parameters are freely configurable, and results can be printed along with graphics.

The system supports post-yield extensometer removal, automatically switching from deformation to displacement collection once a sample has been submitted. A notification alerts users that "deformation switch is complete, extensometer can be removed."

Additional automation features include automatic return, where the moving crosshead returns to the initial testing position, and automatic calibration, which calibrates load and elongation based on the standard input.

The system operates in a full-range, classification-free measurement mode, with a modular unit design that allows for easy accessory exchange, function extension, and maintenance. During testing, the automatic switch function adjusts the displayed curve dynamically based on test force and deformation, ensuring optimal visualization throughout the process.

TECHNICAL SPECIFICATIONS

Measurement Parameters	
Maximum test force	30kN / 6744.27 lb.f(can add load cells to extend the force range)
Accuracy class	0.5

Measurement Parameters	
Measuring range of test force	0.2%~100%FS (full scale)
Indicating error of test force	Within ±0.5% of indicating value
Resolution of test force	±1/300000 of maximum test force, grade unchanged and resolution unchanged in whole process
Measuring range of deformation	0.2%~100%FS
Indicating error of deformation	Within ±0.5% of indicating value
Resolution of deformation	1/300000 of maximum deformation
Indicating error of displacement	Within ±0.5% of indicating value
Resolution of displacement	0.025μm
Control Parameters	
Adjustable range of force control rate	0.005～ 5%FS/s
Control accuracy of force control rate	When rate is less than 0.05%FS/s, within ±2% of setting value; When rate is no less than 0.05%FS/s, within ±0.5% of setting value.
Adjustable range of deformation rate	0.005～ 5%FS/s
Control accuracy of deformation rate	When rate is less than 0.05%FS/s, within ±2% of setting value; When rate is no less than 0.05%FS/s, within ±0.5% of setting value.
Adjustable range of displacement rate	0.001～ 500mm/min
Control accuracy of displacement rate	When rate < 0.5mm/min, within ±1% of setting value; When rate ≥ 0.5mm/min, within ±0.2% of setting value
Other Parameters	
Effective testing width	440mm

Measurement Parameters	
Effective distance of tension	610mm (including wedge tensile fixture and can be custom-made according to user’s requirements)
Removable distance of beam	970mm
Size of Main Unit (length x width x height)	(820 × 620 × 1880) mm
Weight of Main Unit	350Kg
Voltage	220V, 50Hz, 0.75kW (110V is also available)

Configuration

1. Main Frame: 30kN Door Structure

1. Frame: TTM series frame (1 set)
2. Ball Screws: High-precision, zero-clearance (2 pieces)

2. Control & Measurement System

1. Servo motor, servo speed regulation and control system (1 set)
2. Synchronous Belt (1 set)
3. Load cells: 30kN load cells (1 piece)
4. DSC-10TT Full Digital Closed-Loop Measuring & Control System (1 set)
    1. Load Measuring System
    2. Displacement Measuring System
    3. Deformation Measuring System
5. DSC-10TT Software (English version)

6. Remote Control Unit: Includes an LCD screen for real-time display of equipment status, testing force, and displacement. Features a magnetic base for flexible positioning on the frame (1 piece).
7. PC (Lenovo) (1 piece)
8. Printer (HP Color Inkjet, A4) (1 piece)

3. Grips (Customizable as per customer requirements)

1. Wedge Tensile Grips (Jaw size: Flat 0-7mm; V Φ4-Φ9mm) – 1 set per size
2. Compression Plates (Plate diameter: Φ100mm) – 1 set

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Remote Control Unit

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