VECTOR
SCIENTIFIC TESTING DEVICES

UNIVERSAL TEST MACHINE

Tesla Series – Single-Column (0.5 – 2 kN)

Vector's Tesla Series Single-Column testers offer high-precision materials testing in a compact, space-saving frame. Designed for benchtop use, these low-force machines (available in models up to 2 kN deliver laboratory-grade performance without consuming valuable lab space. Ideal for R&D and small-scale quality control, each single-column tester provides flexible mounting options and easy relocation, enabling use in various environments with minimal footprint. The robust single-column design ensures stability for tension, compression, peel, and bend tests on delicate specimens, while an advanced digital controller guarantees reliable, repeatable results for even the most demanding small-force applications.

VTR-40-0002

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Tesla Series

Single-Column (0.5–2 kN)

Key Features & Benefits

High-Speed Data Acquisition: Tesla Series controllers capture data at up to 2 kHz (5,000 samples/second), far surpassing the ~1 kHz sampling rates of typical competing systems. This 5× faster data rate means even rapid events (like brittle fracture of a small specimen) are recorded with superior detail, improving result accuracy and analysis.

Precision and Accuracy: Achieve ±0.5% load measurement accuracy down to 1/10000th of the load cell capacity, ensuring reliable force readings even at very low loads. This exceeds the usual accuracy range of many competitors (which often guarantee ±0.5% only from 1/250 or higher of capacity). Each frame and load cell is calibrated to international standards (ASTM E4, ISO 7500-1 Class 0.5), so you can trust the results for research-grade applications.

Rigid, Lightweight Frame: The single column is engineered for high stiffness with negligible deflection, even at full 5 kN load. The open-column design includes integrated T-slot channels for attaching accessories (e.g. extensometers, camera mounts, shields) without clutter. Unlike bulky dual-column machines, the Tesla single-column's slim footprint and light weight allow easy benchtop placement or relocation while maintaining excellent alignment and stability during testing.

Wide Speed Range: Perform tests from ultra-slow creep rates to fast tensile pulls. The precision drive system enables crosshead speeds from near 0 (0.0001 mm/min) up to ~1000 mm/min (model-dependent), covering a broader range than many small testers. This flexibility lets researchers simulate conditions from slow material deformation to high-strain-rate pulls in one machine. Competitor benchtop testers often cap at lower speeds (e.g. 500 mm/min) for similar capacity, whereas the Tesla single-column offers both speed and control for diverse testing needs.

Vertical & Horizontal Operation: For ultimate R&D flexibility, the frame can be used in vertical orientation or laid horizontal when required (e.g. for specific tensile fixture setups or integration into other equipment). This multi-orientation capability – a feature normally only found in select competitor models – allows innovative test configurations without needing a different machine.

Expandable Sensor Inputs: The system supports up to six synchronized sensor channels (e.g. load cell, extensometer, auxiliary transducers, strain-gauges) tracked in real-time, surpassing the typical 2-4 channel limit on competitor machines. This means you can plug in multiple load cells or strain gauges concurrently and capture all signals in one test – ideal for R&D experiments requiring comprehensive data.

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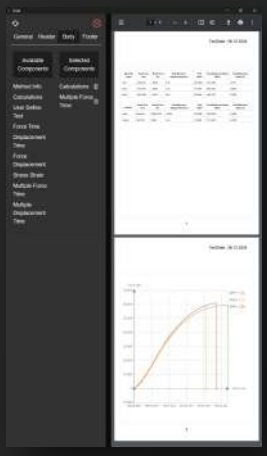
Advanced Software & Control

Intuitive Test Software: Vector's control software comes pre-loaded with an extensive library of standard test methods (tensile, compression, peel, etc.), including dozens of ASTM/ISO protocols. Over 600+ predefined test templates cover everything from plastics and thin films to biomedical textiles, ensuring compliance with industry standards out-of-the-box. For research needs, users can easily customize test sequences or create new methods using a workflow-based editor – all with a few clicks, no coding required.

Powerful Data Analysis: Live graphs and statistics are displayed during the test for immediate insight. After testing, the software automatically calculates key results (tensile strength, modulus, elongation, etc.) and generates customizable reports. Advanced analysis tools (curve fitting, custom formula calculations, pass/fail criteria) are included for in-depth R&D analysis or quality reporting. Results and raw data can be exported in multiple formats for further analysis or collaboration.

High-Speed Controller & Precision Drive: The Tesla single-column frames use a digital closed-loop controller with an update rate over 1000 Hz, ensuring smooth and precise control of force and displacement. This fast, adaptive drive control (matching or exceeding the 1 kHz control loop found in top competitors) guarantees that even sudden load changes are tracked and controlled without overshoot. The benefit is exceptionally stable test control – important for holding precise load or strain rates in sensitive tests.



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Safety & Ergonomics

Operator Safety Priority: The Tesla Series single-column machines are designed with full compliance to CE Machinery Directive safety requirements. An emergency stop button is mounted on the frame within easy reach, instantly cutting power to the drive and halting the crosshead in any emergency. An optional transparent safety shield can be attached to protect the user from debris; when the shield is open, an interlock automatically prevents crosshead movement, similar to the safety interlocks on high-end competitor systems. Dual-level limit switches (software and hardware) stop travel at user-defined limits to avoid accidental over-travel. A two-channel safety circuit monitors all critical functions redundantly, ensuring that any single fault will not compromise user safety.

Ergonomic Design: The single-column frame is easily accessible from three sides, making it simple to load specimens and change fixtures. The crosshead height can be adjusted with one-handed ease, and an optional pneumatic lift assists with heavier attachments. The machine operates quietly (typical noise < 60 dB at max speed), suitable for office or laboratory environments. Has large, glove-friendly buttons for those who prefer physical controls, and can be mounted magnetically on the column when not in use. All user touch points – such as the control panel and grip handles – are designed for comfort and reduce operator fatigue during repetitive testing.

Maintenance & Reliability: The Tesla single-column testers are built for long-term, hassle-free operation. The ball screws and guide columns are precision-machined and pre-loaded to minimize play; they require minimal maintenance and are protected from dust/debris by bellows covers. The drive system is brushless and efficient, generating little heat and automatically entering an “eco” standby mode when idle to save energy. Every machine undergoes rigorous factory calibration and endurance testing – you can expect years of reliable service, with Vector’s service network available for annual calibration verification or any support needed.

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Versatility & Applications

The Single-Column Tesla testers excel in low- to mid-range force applications across numerous industries. Their combination of precision and flexibility makes them ideal for research and development use – from characterizing the tensile properties of polymers, films, and biomedical materials, to performing routine QA on consumer products like packaging, textiles, or electronics. The space-saving design fits into crowded labs or production floors, yet the system's capabilities rival larger machines. Whether you are a materials scientist developing a novel fiber, an electronics manufacturer testing solder joint strength, or a university lab teaching tensile testing fundamentals, the Tesla single-column series provides a robust, easy-to-use solution. It brings together best-in-class technical performance (fast data capture, accurate results) with a compact form factor tailored for maximum versatility in any R&D or small-scale testing environment.

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Key Features & Industries

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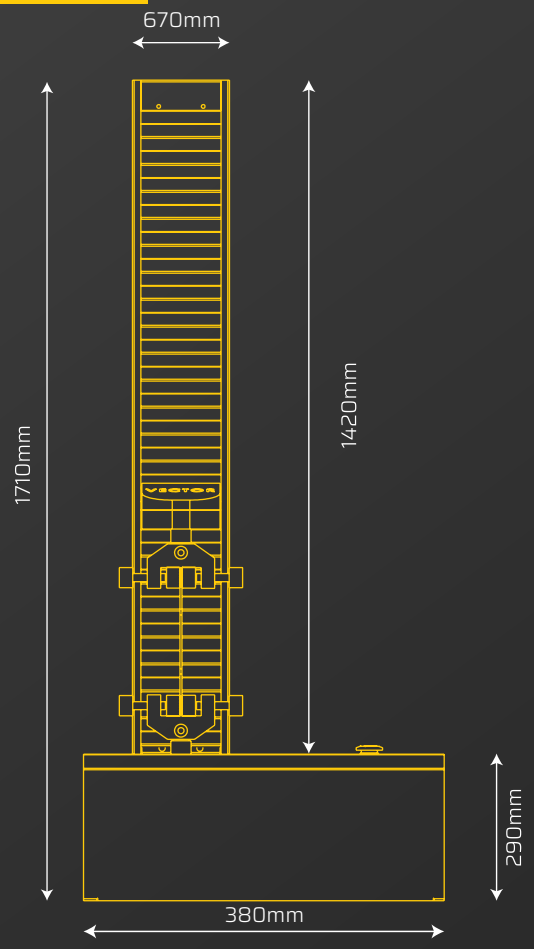
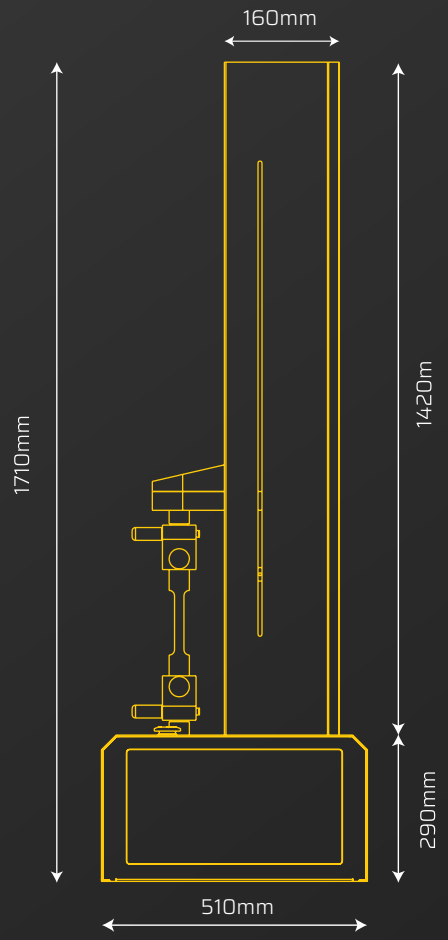


High-Capacity and Durable Testing Solutions: Tesla Series



High-Capacity and Durable Testing Solutions: Tesla Series

TECHNICAL SPECIFICATION

Specification	VTR-40-0002
Max Capacity	2 kN
Frame Design	Single Column
Overall Dimensions (H×W×D)	350x400x1100 mm
Test Space Height	600 mm (configurable)
Speed Range	0.0001 – 1000 mm/min
Data Acquisition	5 kHz; 24-bit resolution
Accuracy Class	±0.5% per ISO 7500-1 (Class 0.5)
Power Requirements	120/240 V, 50/60 Hz
Operator Interface	PC software
Connectivity	USB
Safety Features	Emergency stop, limit switches, optional shield
Weight	~100 kg
Optional Accessories	Various grips, extensometers, shield