MTS Insight[™] Electromechanical Testing Systems



Experience the power of an accurate and user-friendly testing system, targeted to meet your static testing needs.



Simplify Testing with MTS Insight Electromechanical Testing Systems

MTS Systems Corporation offers you the world-class line of MTS Insight Electromechanical Testing Systems, targeted to meet your testing needs as well as your budget. MTS Insight testing systems are ideal for testing a wide range of materials and components in a variety of industries. Featuring a high level of accuracy and ease-of-use, MTS Insight testing systems are adaptable to the way you work. The power of each MTS Insight testing system is backed by the support and experience of MTS worldwide service. Configuring your MTS Insight system is easy, just select from top-quality MTS Insight testing load frames and accessories, and from a suite of innovative TestWorks[®] 4 Testing Software tools. For most common tests, TestWorks 4 software offers preset testing methods that can be tailored to meet your individual test requirements and laboratory workflow. You can also use MTS consulting services to develop new testing methods specifically designed for your applications.

As the world leader in material and component testing products, MTS is committed to providing innovative and reliable electromechanical testing systems. MTS Insight Electromechanical Testing Systems demonstrate this commitment.



Harness the Strength of an Integrated Testing System

The testing power and utility of each base MTS Insight testing system is created through a networked set of three major elements: the personal computer (PC) running TestWorks 4 Testing Software, the load frame with integrated digital controller, and the programmable handset. These three components create an integrated testing system that offers flexible testing capabilities with a simple operator interface.

The operator uses the PC to quickly and easily run tests with TestWorks 4 Testing Software. TestWorks 4 sends testing instructions to the load frame's internal digital controller for high-speed testing control. As the test is run, the digital controller collects and interprets test data to send back to TestWorks 4 for display, analysis, and reporting. The handset allows the operator to perform standard and programmable functions while standing close to the test specimen. All MTS Insight testing systems offer load cells with TEDS self-identification capabilities that follow the recently adopted IEEE 1451.4 standard. Load cell self-identification increases laboratory efficiency and reduces potential operator error by eliminating the need to manually enter load cell and transducer identification information

Powerful Testing Capabilities in a Smaller Package

MTS Insight Electromechanical Testing Systems offer a full range of testing capabilities, with a smaller load frame footprint. Single-column load frames and double-column load frames are available with a range of load capacities. Constructed with a solid steel crosshead and table for stiffness, MTS Insight testing systems are designed to deliver exceptional results, and feature excellent reliability, performance, and accuracy. MTS Insight testing systems are easy to maintain, and all MTS system components are covered by a one-year warranty.

MTS Insight testing systems dependably perform standard tests such as peel, tear, sheer, tensile, compression, and flex/bend. More advanced tests can also be performed, such as creep, stress relaxation, and multi-cycle. Offering user-defined crosshead speeds as well as advanced control modes such as load and strain, MTS Insight testing systems can analyze a wide array of materials, including components, biomaterials, plastics, metals, elastomers, paper products, adhesives, and foam. Anti-rotate feature improves alignment, prevents accidental drops, and provides for repeatable positioning.

MTS Insight load frames also offer:

- Precision antibacklash ballscrews
- Precision guide columns
- Integrated load cell connection on the crosshead
- Drive system using a DC Servo motor and a four quadrant DC drive
- Ballscrew encoder
- Quiet drive system

Fully integrated into the load frame, the digital controller features:

- ▶ Up to 1000 Hz DAQ rate
- A 1000 Hz control rate
- 20-bit resolution
- ▶ Built-in USB 2.0 for PC communication
- Self-ID capability for calibration and auto-ranging
- ► Two optional strain inputs in addition to the system load cell
- Three optically isolated digital inputs and outputs
- ► Two BNC monitor connectors
- A test area enclosure interlock connector

Truly the brainpower behind MTS Insight testing systems, TestWorks 4 Testing Software provides quick set-up and full computer automation. TestWorks 4 enables the user to easily perform tests, and display, analyze, report, and archive testing data. The MTS Insight handset allows the operator to perform standard functions such as start, stop, pause, and crosshead positioning while standing close to the test specimen. The handset can display test status messages, performance messages, and results. Two programmable function keys are set up in the software as digital inputs; allowing users to define test functions such as start test, pause and hold position. The handset features a small, ergonomic design for both right-handed and left-handed operators and a large display that provides information at a glance.



MTS Insight Safety Features

To ensure operator safety, MTS Insight testing systems integrate safety features such as:

- Push-button emergency stop and a remote enable/disable switch
- Mechanically adjustable limits to stop the crosshead at predetermined points
- Motor overheat device to automatically turn off the motor power supply
- Ability to set limits for load, extension, strain, or any other data channel
- Safe system voltage of 48V
- Anti-rotate feature
 - Orients fixturing
 - Improves alignment
 - Pin prevents accidental attachment drops
- Repeatable fixture positioning

Additional Options to MTS Insight Testing Systems

- Additional software test method options
- Custom-designed test methods
- Wide variety of testing accessories
- Consulting services
- Extended travel
- T-Slot tables
- Test area enclosure
- Workstation stand
- Up to 32 additional external channels

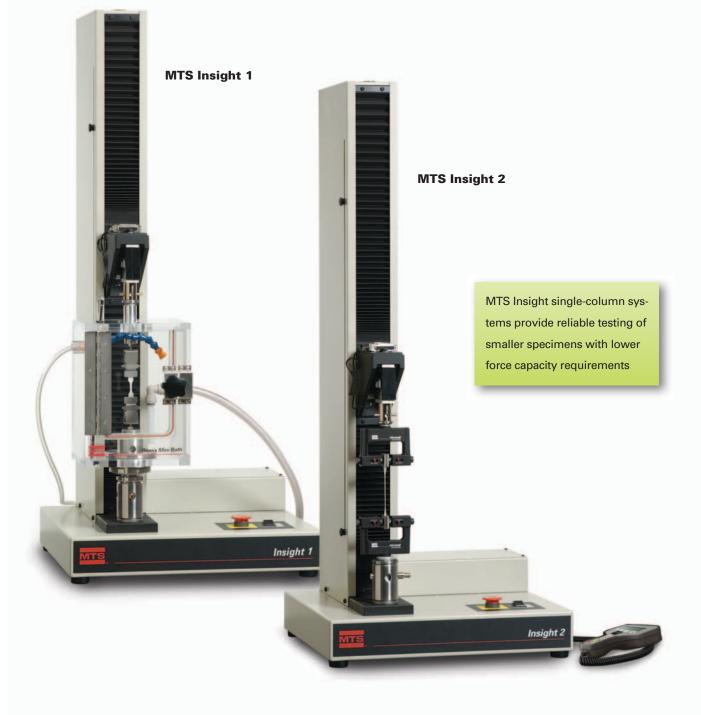
ReNew® Upgrade Program

In certain circumstances, a ReNew upgrade can be a good, cost-effective alternative to purchasing a new testing system. ReNew upgrades can extend the life of existing testing systems that need electronic and software rejuvenation. Available for testing systems from Instron Corporation and other suppliers, each ReNew testing system is tailored to meet your requirements and provides full computer automation with TestWorks Testing Software. The result is better reliability of older test frames, and a common interface to streamline testing workflow. ReNew testing systems feature highspeed data acquisition, state-of-the-art software and electronics, networking of test data, and automation and sequencing of most manual tasks. Most MTS ReNew testing systems can be upgraded as new software versions become available. ReNew testing systems receive world-class MTS service and support.



Single-Column MTS Insight Electromechanical Testing Systems

Featuring a tabletop, single-column design, MTS Insight Models 1 and 2 Electromechanical Testing Systems provide a wide range of testing capabilities in a compact, ergonomic frame. These systems are ideal for low-force applications like tensile, compression, bend, peel, and shear tests. Extended length frames are available for high elongation testing. The MTS Insight Model 1 and 2 kN systems feature a maximum force capacity of 1 kN and 2 kN respectively. These models combine an elegantly simple drive system, state-of-the-art electronics, and an intuitive user-interface to produce accurate, reliable, and superior quality results. As with all MTS Insight systems, TestWorks can be configured to meet your specific test requirements.



Two-Column MTS Insight Electromechanical Testing Systems



TestWorks[™] 4 Testing Software: The Brainpower Behind the MTS Insight Solution

TestWorks 4 Testing Software has the power to streamline your testing procedures by adapting to the way you work. TestWorks 4 is an innovative and flexible Windows®-based software program. You can readily configure TestWorks 4 to handle your most demanding requirements, while maintaining an interface that is user-friendly, even for the novice operator. Intuitive menus and controls make initial test set-up and ongoing operation simple. As your testing needs grow, TestWorks software can expand to meet your requirements.

Peel, tear, sheer, tensile, compression, and flex tests are included in the standard TestWorks 4

package. You can expand your testing capabilities at any time by purchasing additional software test methods, or by using MTS consulting services to develop customized test methods for your specific applications.

As new TestWorks software versions become available, you can continue to improve your laboratory's productivity by easily updating your MTS Insight testing system. You can further increase your laboratory's productivity by using TestWorks 4 across multiple testing stations, allowing operators to use the common interface without retraining.



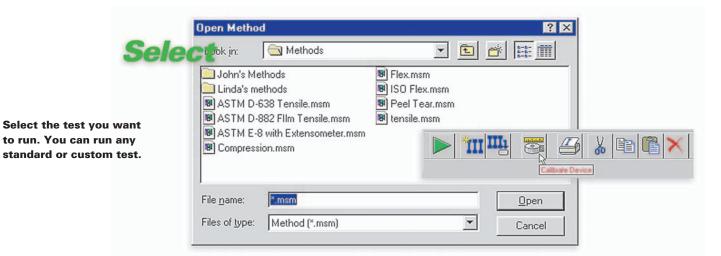
TestWorks 4 features a Virtual Control Panel[™] screen that allows the operator to control the MTS Insight testing system from the computer. With operator-configurable options, large buttons, and large display meters for monitoring, this user-friendly screen provides all the important functions of the testing system.

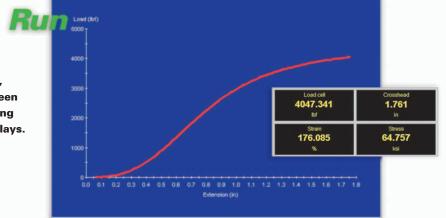
Optional Test Methods

Optional TestWorks 4 test methods are available for purchase, including:

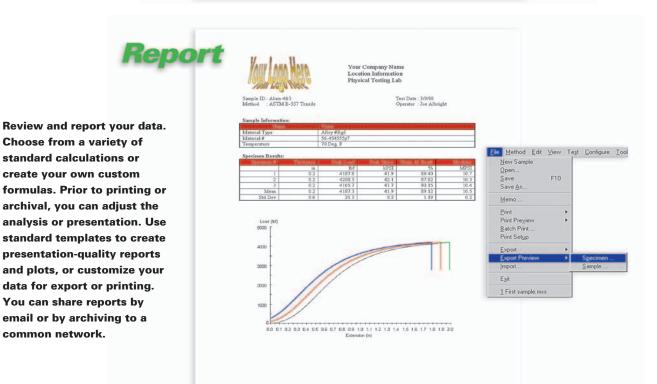
- Plastics
- Creep/stress relaxation
- Limited cyclic
- ► Foam
- N, R and K for sheet metals

Complete Your Test in Just Three Steps





While the test is running, monitor your test on-screen using real-time autoscaling graphics and digital displays.



TestWorks[™] 4 Software Packages

Essentials

The TestWorks 4 Essentials software package runs preset testing methods. Recognized as an industry leader, the Essentials package is the base product for both the Advanced package and the Creator package.

Advanced

The TestWorks 4 Advanced software package runs preset testing methods with the ability to add non-motion control test segments.

Creator

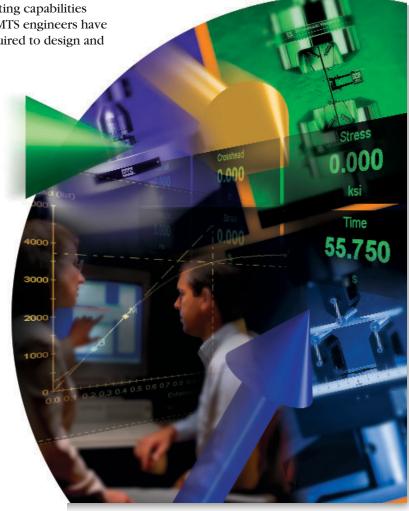
The TestWorks 4 Creator software package is designed for the knowledgeable user who wants to create or modify test methods by adding and sequencing motion or control segments.

Software Test Methods Consulting

To maximize the value of your MTS Insight testing system, MTS consulting and engineering services can develop custom testing capabilities specific to your application. MTS engineers have the experience and skills required to design and develop a unique testing method for virtually any industry or test type. Test methods can be completed in as little as a few days, and the resulting solution can be emailed to you. MTS can design the following software capabilities to your specifications:

- Custom test methods, tailored to meet your unique test specifications
- Custom report templates, formatted in your organization's reporting style
- Custom export templates to allow for customized data archiving

MTS custom test methods, report templates, and export templates are guaranteed to perform to your specifications and come with 30 days of free technical support to ensure your requirements are met.



MTS Lifecycle Management

The MTS Lifecycle Management program helps you make the most productive and cost-effective use of your valuable testing resources.

Experienced Materials Testing Consulting

With in-depth experience designing standard and customized testing solutions, MTS consultants are available to help you use the most up-to-date techniques, hardware, and software to maximize testing performance and efficiency.

Worldwide Field Service

MTS field service engineers are world-class trained professionals, strategically located around the world to provide a prompt response to service needs such as calibration and verification, preventive maintenance, scheduled and emergency repair, and spare parts.

Comprehensive Customer Support

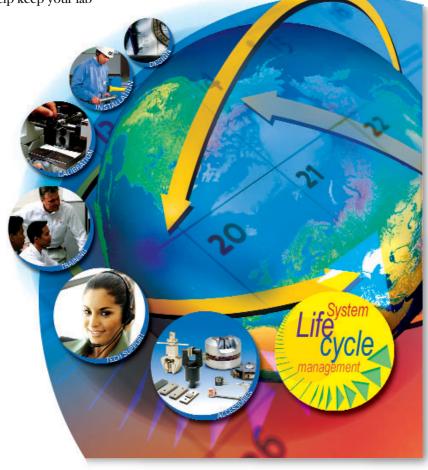
MTS provides a range of customer support options. From providing assistance with troubleshooting to answering questions about software, our experienced support engineers help keep your lab running smoothly.

Lifecycle Management Support Packages

To enhance and extend the functional life of your testing system, you can customize your Lifecycle Management support package to include services such as:

- ► Telephone-based or web-based technical support
- On-site field service support
- Consulting services for lab design, test development, or test method development
- Hardware and software upgrades and maintenance packages
- Extended warranties
- Training for testing methodologies and for system theory and operation

The MTS Lifecycle Management program will enhance the performance of your testing system, increase its useful life, and lower your total cost of ownership. For more information, call your MTS Sales and Service office or visit our Services and Support web site at www.mts.com/services.



Industry Applications for MTS Insight Testing Systems

MTS Insight testing systems are powerful tools for use in areas such as research and development, product and process development, and quality assurance and manufacturing processes. MTS offers a complete range of high-quality accessories for a wide array of testing applications. Contact MTS for a complete catalog of our accessory offering.

Consumer Products Testing

Consumer-products testing requires a flexible system for unique testing applications. MTS Insight testing systems meet the challenge of testing virtually any product, such as tissue paper, plastic for bags, Velcro, closures, packaging materials, and foam materials. Tests for these products can include high-strain tensile tests, direct peel tests, and indention force deflection.

MTS

A typical configuration for highelongation tensile testing includes:

- 100/200 N Advantage Pneumatic Grips
- Advantage Pneumatic Grip Controller
- Smooth Rubber Grip Faces
- Insight XLT High Elongation Extensometer (not shown)
- One Strain Channel
- TestWorks 4 Advanced Option

Biomedical Testing

Use MTS Insight testing systems for biomedical applications such as analyzing cosmetic implant materials, testing joint replacement compounds, static characterization of replacement and soft tissue materials, and determining medical tubing, tape and suture properties. Common tests include tension and compression and flexure, performed in ambient conditions and high humidity or submerged conditions.



A typical configuration for saline environment tensile testing includes:

- ► 658.07 Saline Environmental Bath
- 10 N Advantage Spring Action Grips
- Corrosion Resistant Pull-rods
- LX 500 Laser Extensometer (not shown)
- One Strain Channel
- TestWorks 4 Advanced Option

Basic Materials Testing

MTS Insight testing systems offer easy-to-use tensile compression and flexure templates for basic materials testing. Analyze materials such as ductile iron, stiff plastic, and paper in tests such as ambient temperature tensile, ambient temperature com-

pression, and ambient temperature flexure.

A typical configuration for ambient temperature tensile testing of plastic includes:

- 634.25 Extensometer for **General Applications**
- Advantage 2 kN Pneumatic Grips
- **Diamond Serrated Faces**
- **TestWorks 4 Basic Materials Methods Package**



Aerospace Testing

In the aerospace industry, MTS Insight testing systems can analyze high-strength and high-temperature materials such as polymer and metal matrix composites, super alloys, high-modulus fibers, and impacted panels. Common tests for this industry include ambient and elevated temperature tensile, standard and open-hole compression, flexure, flatwise shear, climbing drum peel, and strain-hardening parameter (N, R and K value) determination.

A typical testing configuration for

- determining N-values consists of: MTS -200° F to 600° F Chamber
- MTS 647 Hydraulic Grips
- MTS 685 Stand Alone Grip Supply
- MTS Bi-axial Extensometer
- Two Strain Channels
- TestWorks 4 N, R and K
- **Methods Package**

Typical room temperature biaxial test setup shown:

- MTS 647.02B flat specimen wedges
- 634.25F axial extensometer
- 632.23 cross-sectional strain extensometer

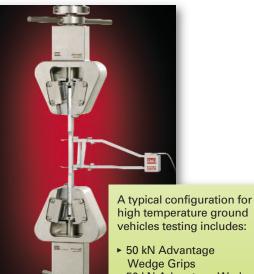


(shown with 634.25

extensometer)

Ground Vehicles

For monotonic loading of ground vehicle components and materials, use MTS Insight testing systems to test high-performing new material systems, first-run components, and sub-assemblies, or test samples of parts right on the production line. You can analyze rigid plastics, elastomers, automotive sub-system components, audio equipment, and microelectronic components in tests such as ambient temperature tensile, compression, shear, flexure, and Poisson's ratio.

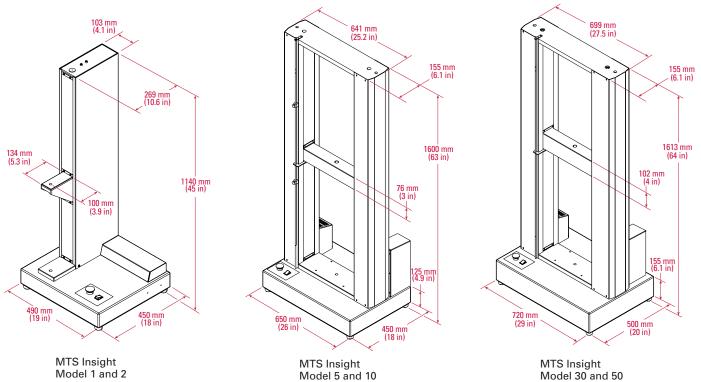


50 kN Advantage Wedges

- for flat specimens -200° F to 600° F Chamber
- (not shown) ► 633.11 High-temperature
- Extensometer (not shown) One Strain Channel
- **TestWorks 4 Creator**
- Option

MTS Insight Electromechanical Testing Systems Specifications

Model	MTS	MTS	MTS	MTS	MTS	MTS	MTS	MTS	MTS	MTS
	Insight 1	Insight 1 EL	Insight 2	Insight 2 EL	Insight 5	Insight 5 EL	Insight 10	Insight 30	Insight 30 EL	Insight 50
Force Capacity	1 kN	1 kN	2 kN	2 kN	5 kN	5 kN	10 kN	30 kN	30 kN	50 kN
	(225 lbf)	(225 lbf)	(450 lbf)	(450 lbf)	(1125 lbf)	(1125 lbf)	(2250 lbf)	(6750 lbf)	(6750 lbf)	(11250 lbf)
Vertical Test Space Crosshead Travel	750 mm (29.5 in)	1004 mm (39.5 in)	750 mm (29.5 in)	1004 mm (39.5 in)	1100 mm (43 in)	1400 mm (55 in)	1100 mm (43 in)	1100 mm (43 in)	1400 mm (55 in)	1100 mm (43 in)
Maximum	1500 mm/min	1500 mm/min	1000 mm/min	1000 mm/min	1000 mm/min	1000 mm/min	1000 mm/min	500 mm/min	500 mm/min	500 mm/min
Test Speed	(59 in/min)	(59 in/min)	(39 in/min)	(39 in/min)	(39 in/min)	(39 in/min)	(39 in/min)	(19.7 in/min)	(19.7 in/min)	(19.7 in/min)
Minimum	0.001 mm/min	0.001 mm/min	0.001 mm/min	0.001 mm/min	0.001 mm/min	0.001 mm/min		0.001 mm/min	0.001 mm/min	0.001 mm/min
Test Speed	(0.00004 in/min)	(0.00004 in/min)	(0.00004 in/min)	(0.00004 in/min)	(0.00004 in/min)	(0.00004 in/min)		(0.00004 in/min)	(0.00004 in/min)	(0.00004 in/min)
Height	1140 mm	1394 mm	1140 mm	1394 mm	1600 mm	1900 mm	1600 mm	1613 mm	1913 mm	1613 mm
	(45 in)	(55 in)	(45 in)	(55 in)	(63 in)	(74.75 in)	(63 in)	(64 in)	(75.75 in)	(64 in)
Width	490 mm	490 mm	490 mm	490 mm	650 mm	650 mm	650 mm	720 mm	720 mm	720 mm
	(19 in)	(19 in)	(19 in)	(19 in)	(26 in)	(26 in)	(26 in)	(29 in)	(29 in)	(29 in)
Depth	450 mm	450 mm	450 mm	450 mm	450 mm	450 mm	450 mm	500 mm	500 mm	500 mm
	(18 in)	(18 in)	(18 in)	(18 in)	(18 in)	(18 in)	(18 in)	(20 in)	(20 in)	(20 in)
Weight	50 kg	55 kg	50 kg	55 kg	115 kg	123 kg	115 kg	180 kg	191 kg	180 kg
	(110 lb)	(119 lb)	(110 lb)	(119 lb)	(255 lb)	(261 lb)	(255 lb)	(397 lb)	(422 lb)	(397 lb)
Clearance from Loading Axis to Column Cover	100 mm (3.9 in)	100 mm (3.9 in)	100 mm (3.9 in)	100 mm (3.9 in)	N/A	N/A	N/A	N/A	N/A	N/A
Space Between Columns	N/A	N/A	N/A	N/A	405 mm (15.9 in)					
Frame Stiffness at Normal Load Points	7 kN/mm	7 kN/mm	7 kN/mm	7 kN/mm	100 kN/mm	100 kN/mm	100 kN/mm	100 kN/mm	100 kN/mm	100 kN/mm
Power Requirements										
Power Supply	120 or	120 or	120 or	120 or	120 or	120 or	120 or	120 or	120 or	120 or
	230 VAC	230 VAC	230 VAC	230 VAC	230 VAC	230 VAC	230 VAC	230 VAC	230 VAC	230 VAC
	(single phase)	(single phase)	(single phase)	(single phase)	(single phase)	(single phase)	(single phase)	(single phase)	(single phase)	(single phase)
Power	.33 kW	.33 kW	.33 kW	.33 kW	<i>.</i> 53 kW	.53 kW	.53 kW	.53 kW	<i>.</i> 53 kW	.53 kW



MTS Insight Model 5 and 10

MTS Insight Model 30 and 50

MTS Insight Electromechanical Testing Systems, All Models

Force Capacity at Max Test Speed	100% for MTS Insight 1, 2, 5, and 30
	50% for MTS Insight 10 and 50
Max Test Speed at Rated Force Capacity	100% for MTS Insight 1, 2, 5, and 30
	50% for MTS Insight 10 and 50
Speed Accuracy*	±0.05% of full speed
Position Accuracy*	0.01 mm (0.0004 in)
Position Resolution	0.001 mm (0.00004 in)
Motor and Drive System	Precision DC Servomotor, DC 4 Quadrant Motor Drive
Speed Control	Continuously variable
Ballscrews	Anti-backlash
Crosshead Guidance	Precision rail on MTS Insight 1 and 2 Precision guide columns on MTS Insight 5, 10, 30, 50
Position Measurement	Optical encoder
Strain Channels	Two optional conditioned strain channels
	 One optional digital channel available with conditioning for high elongation extensometers
	Eight additional channels available
Environmental Requirements Operating Temperature Maximum Operating Humidity Storage Temperature Maximum Storage Humidity	50 to 100°F (10 to 38°C) 70% non-condensing 0 to 120°F (-18 to +49°C) 90%

* In order to follow ASTM standards, MTS recommends on-site calibrations per relevant standards.



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