

Quoted To	
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Bruker Hysitron TI Premier® Nanomechanical Test System



The Bruker Hysitron TI Premier® –

The TI Premier Series was specifically designed to deliver quantitative and highly reliable nanomechanical characterization within a compact platform.

- Reliable quantitative nanomechanical and nanotribological characterization, applicable from traditional materials to the state-of-the-art thin films and beyond
- Essential tool for basic to advanced nanomechanical testing, utilizing Hysitron's capacitive transducer technology for superior characterization of hardness and reduced modulus
- Nano wear technique provides quantitative characterization of tribological properties of materials
- In situ SPM imaging enables topographical visualization of the surface prior to performing a measurement along with nanometer scale accuracy in test positioning for maximum test reliability
- Versatile system configuration, easily adaptable to meet specific research needs

Includes the following components:			
Catalog	Product	Description	
5-1560-220	TI Premier Base System <i>220-240V 50/60Hz power.</i>	<i>Includes The following:</i>	
	One-Dimensional Transducer Assembly	<ul style="list-style-type: none"> • Up to 10mN normal force • Patented 3-plate capacitive transducer • Measurement of normal force and displacement for nanoindentation testing • Electrostatic force actuation/capacitive displacement sensor • Rigid dovetail mounting assembly • Drive circuit board • Capacitive displacement detection card 	
	<i>In-situ</i> SPM Imaging	<ul style="list-style-type: none"> • Nanometer resolution SPM imaging • Provides precise indenter tip placement • Pre- and post-imaging of test sites • Adjustable gain control • Variable scan rate • Topographical imaging • Presentation-grade images 	
	Hysitron Digital Control Module	<ul style="list-style-type: none"> • Digital Signal Processor (DSP) plus Field Programmable Gate Array (FPGA) architecture • USB 2.0 Connectivity • 78kHz internal digital feedback loop rate • 78kHz simultaneous ADC/DAC sampling rate • Integrated piezo control functionality • Modular design that supports base instrument and up to 2 options • Auxiliary digital I/O lines, DAC's, and ADC's for interfacing with external devices 	
	Motorized Translation Stage	<p>X and Y stage</p> <ul style="list-style-type: none"> • Rigid cross roller bearing construction • Travel: 150mm x 50mm <p>Z stage</p> <ul style="list-style-type: none"> • Rigid cross roller bearing construction • Travel: 50mm • Dimensionally stable granite platform and bridge • Custom stage control system 	
	TriboScanner	<ul style="list-style-type: none"> • Piezoelectric X-Y-Z scanner • Dovetail mechanical connectors • Pre-calibrated 	
	Magnetic Sample Holder	<ul style="list-style-type: none"> • Stainless steel chuck for sample mounting • Four magnetic positions 	

	Top Down Color Optics	<ul style="list-style-type: none"> • Top-down optics • 0.5X to 11X digital zoom • 10 X Objective • Polycarbonate Calibration Standard • Color CCD camera • Maximum Field of View 3200x2400 μm • Minimum Field of View 145x109μm 	
	Dedicated Workstation	<ul style="list-style-type: none"> • Intel Core i5 Processor • 4GB RAM • 1 TB HD • Multi Monitor Capability • 19" Monitor • Windows License 	
	Environmental Isolation System	<p>Passive Vibration Isolation</p> <ul style="list-style-type: none"> • Negative stiffness technology • ½ Hz natural frequency <p>Environmental Enclosure</p> <ul style="list-style-type: none"> • Custom engineered, multi-layered for acoustic, air current, and thermal isolation 	
	Feedback Control Package	<ul style="list-style-type: none"> • Closed loop feedback control of normal load or displacement while indenting and scratching • 78kHz feedback loop rate for precise control • Displacement control to indent to a predetermined depth or to maintain a constant displacement for stress relaxation tests • Load control to obtain set load at contact point or to maintain constant load for creep test • Intuitive user-defined loading parameter or displacement control scheme 	
	TriboScan v.9 Software	<p>Test setup</p> <ul style="list-style-type: none"> • Fully definable load function editor. • Unattended operation after initial setup • PID feedback parameter tuning function <p>Data acquisition</p> <ul style="list-style-type: none"> • Measurement of normal force and displacement • Measurement of lateral force and displacement (when system is equipped with 2D transducer) • User- definable acquisition rates up to 15,000 points/sec with the Hysitron Digital controller. (Upgradeable to Hysitron's performech™ Advanced Control Technology) • Automated routines for high throughput testing <p>Data analysis</p> <ul style="list-style-type: none"> • Automatic curve fitting routine for calculations of tip area functions (calibration) • Multiple file analysis with export of calculated data to text files • Automatic comparison of hardness vs. depth plots from multiple samples 	

		Additional features <ul style="list-style-type: none"> • Intuitive tab navigation scheme • Piezo automation routines • Open-loop and feedback-controlled nanoindentation • Compatible with all Hysitron indenter platforms, transducers, heads, and scanners • Compatible with all current and future upgrade options • Zero-point correction • Partial unloading load function generator • Improved approach algorithms 	
	Equipment Rack Assembly	<ul style="list-style-type: none"> • Rack- mounted electronics assembly under instrument to minimize footprint • Lock In Amplifier • Custom stage control system • Digital Control Module 	
	Diamond Tip for Indentation	<ul style="list-style-type: none"> • Berkovich 142.3 degree, 3 sided pyramidal 	
	Fused Quartz Standard	<ul style="list-style-type: none"> • Standard tip calibration sample 	
	Polycarbonate Standard	<ul style="list-style-type: none"> • Standard tip calibration sample 	
	On-site Installation & Basic Training	<ul style="list-style-type: none"> • System installation, Duration: 2 days • Verification of performance • Hardware & Software Training • Instrument Calibration • Training for optional equipment is provided • Dependent on optional equipment chosen additional travel expenses may be invoiced if multiple site visits are required. 	
	Tool Kit	<ul style="list-style-type: none"> • Torque limited tip mounting tool • Torque limited set-screw wrench 	
	Warranty	<ul style="list-style-type: none"> • 1 year 	

Upgrade options included in recommended package

5-2389	Lateral Force Option <i>(in-lieu of standard 1D transducer)</i>	2D transducer <i>(in-lieu of standard 1D transducer)</i> <ul style="list-style-type: none"> • Up to 10mN normal force, 2mN lateral force • Patented 3 plate capacitive force transducer • Measurement of z-axis and x-axis force and displacement • Electrostatic Actuation/Capacitive Sensor • Rigid dovetail mounting assembly 	
TI-0040	Conical diamond probe for low load transducer	Conical diamond probe <ul style="list-style-type: none"> • 0.5-1.5µm tip radius • 90° cone angle 	

<p>5-1609 & 5-0348-10</p>	<p>High Load Scratch Option for TI Premier, 10N Maximum Force</p>	<ul style="list-style-type: none"> • High load indentation and scratch • User may select one of 4 scratch directions –x, +x, -y, or +y. • Dedicated electronics and control integrated into the digital control module • Selectable closed-loop load or displacement-controlled testing schemes • Proprietary design offers high bandwidth and superior stability • Customized indentation and scratch software for the TI Premier • Maximum normal load range of 10N • Maximum Lateral Force: 5N • Includes threaded sample holders for easy exchange of samples and mechanical rigidity • Stage accepts up to 4 small or 1 large sample holders • One High Load tip included 	
<p>TI-0092</p>	<p>Conical diamond probe for high load transducer</p>	<p>Conical diamond high load probe</p> <ul style="list-style-type: none"> • 5µm tip radius • 60° cone angle 	
<p>5-1819-220</p>	<p>Enviro Shield</p>	<ul style="list-style-type: none"> • Mechanical features to create a low oxygen environment to protect Low Load transducer from damage due to high temperature. • Air pump included • Mechanical features for sample testing in a low oxygen environment • Customer must provide the inert gas 	
<p>5-1773</p>	<p>Electrochemical Nanoindentation (ECNI) cell for Biological and Electro-Chemical Applications</p>	<ul style="list-style-type: none"> • Fluid cell sample holder designed for Biological and Electrochemistry applications • Feature for holding a sample on a microscope slide • Includes one bottom electrode for Electro chemistry applications • Includes clamp for managing tubing and/or leads • Compatible with standard low load and high load transducers • Designed for room temperature conditions • Includes low load Fluid Cell Berkovich – Chemically inert • Potentiostat not included <p>*** Enviro Shield is a recommended option when working with harsh chemicals that may damage transducer sensors.</p>	



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