

5500 Series

Advanced materials testing systems

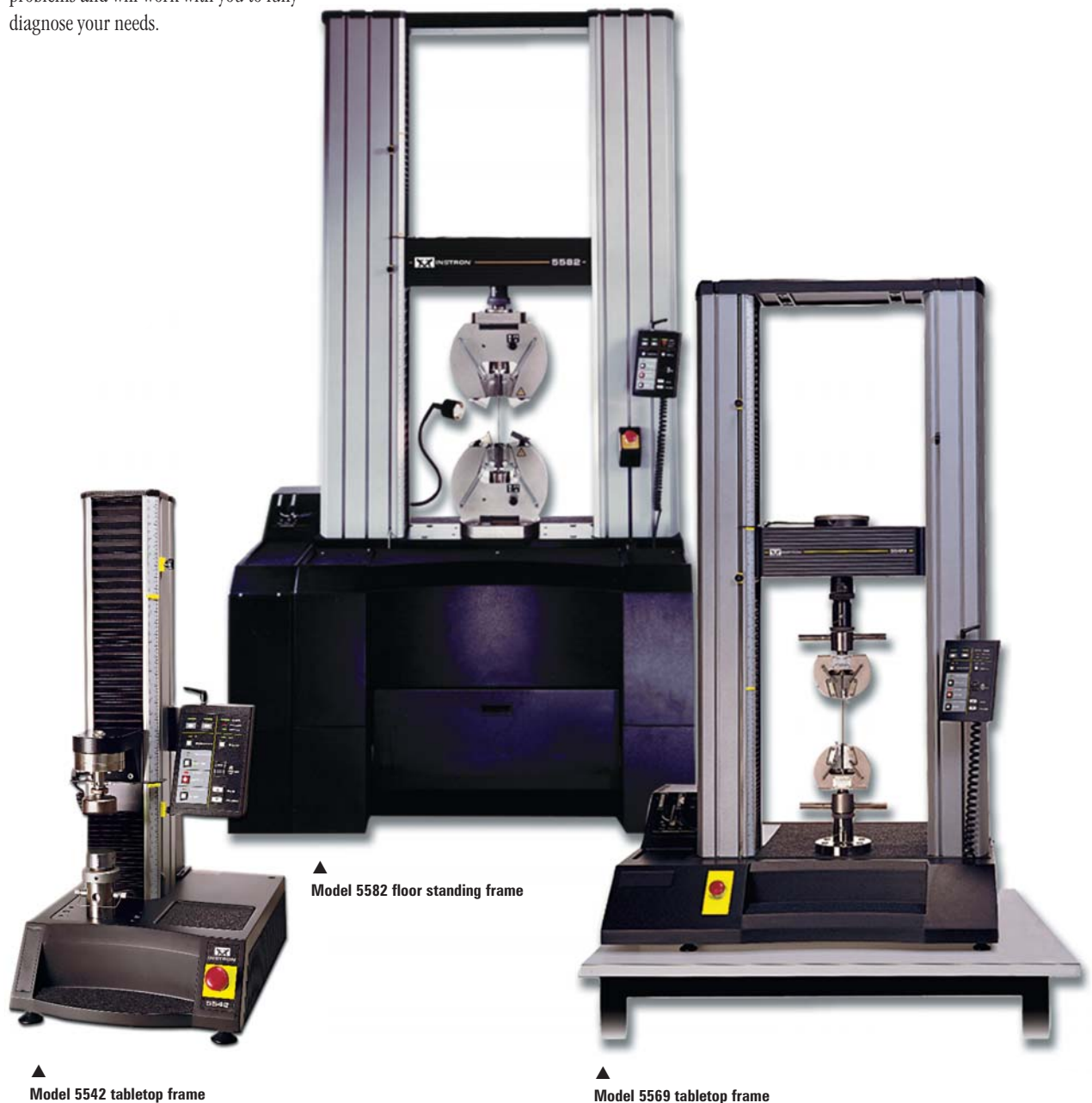


Tailored Application Solutions

The 5500 series material testing systems represent a range of high performance load frames, high band width DSP (Digital Signal Processing) based electronics and Bluehill® 2 modular applications software. When coupled with Instron's extensive application knowledge and wide range of accessories. The 5500 series systems provide the correct testing solution for your laboratory. Solutions however, are end results that start with problems. Instron has built its reputation on understanding the widest array of application problems and will work with you to fully diagnose your needs.

The process of defining a testing system involves a detailed review of your application and laboratory operation as well as discussion about laboratory personnel and their capabilities. Instron works with you to configure the right solution in terms of frame selection, electronic options, software configuration, grips/ fixture choices and service options. This ensures you are testing faster and more accurately with a system that is tailored to your individual application needs.

Instron users range from manufacturers of disposable contact lenses to those testing engineered beams for construction buildings. In the testing of contact lenses, high bandwidth and resolution of the load signal are important. For the manufacturer of engineered beams, Instron's long established reputation for reliable and durable load frames is the difference. Users come to Instron for our wealth of application and equipment expertise which guarantees the appropriate application tailored testing solution.



▲ Model 5542 tabletop frame

▲ Model 5582 floor standing frame

▲ Model 5569 tabletop frame

Load Frames

The 5500 series load frames are available in floor, table and single column configurations to cover the widest range of application needs.

Single column units are popular in the areas of biomaterials or adhesives where specimen load requirements are low. Floor models are frequently the choice of those in the composites and metals industries where specimen size and strength require higher load capabilities.

The frames all incorporate human factor considerations in the design to ensure safety, reduce operator fatigue, and provide the highest level of flexibility. Extremely robust crosshead guidance is incorporated in all frame designs providing the highest level of lateral crosshead stiffness. All frames feature preloaded precision ballscrews to ensure high speed and position measurement accuracy. Load cells are interchangeable for all frames allowing each frame to operate full capacity down to forces below 0.1 gram.

Electronics and User Interface

The 5500 series electronics use advanced DSP technology to ensure fast response, high accuracy and exceptional reliability. This technology provides the high speed processing power necessary to handle all machine control, data acquisition, limit checking and event detection tasks while freeing up the computer to act as the user interface and data storage medium.

The 5500 series electronics have a modular design allowing easily interchanged options such as signal conditioners, multi-channel data acquisition and analog output modules. A second component of the 5500 series electronics is the control panel. This adjustable panel provides the immediacy, tactile feedback and constancy that are paramount in system user interface design.

Bluehill® 2 Software

The 5500 series features Instron's Bluehill 2 application software. Bluehill 2 provides simplicity and power in a single software package. Standard simplicity features like, cut and paste, method conversion, web-like user interface, Microsoft Office reports and emailing add simplicity to your set-up and testing. Power lies within your ability to fully control the test screen layout, formatting, user calculations and detailed help to name a few powerful features.

Bluehill 2 is a fully-integrated modular software package designed to give you flexibility while allowing for future changes in your testing requirements. Bluehill software is divided into six major application modules each tailored to address the unique application requirements of that test type. Parameters such as fixture set-up, test terminology, unit choices and calculations are configured for your type of test, allowing your laboratory to quickly and easily achieve maximum productivity.

Grips, Fixtures and Accessories

Grips and fixtures are a critical aspect of your testing system ensuring that your individual testing requirements are efficiently addressed with the highest level of safety. Almost 60 years of involvement in the materials testing industry has provided Instron with the widest array of accessories, environmental chambers, extensometers grips and fixtures, allowing us to tailor an exact solution for your needs. As your needs change in the coming years, Instron will continue to work with you to adapt your 5500 series system to meet these changing needs. This will ensure continued and full utilization of your system.

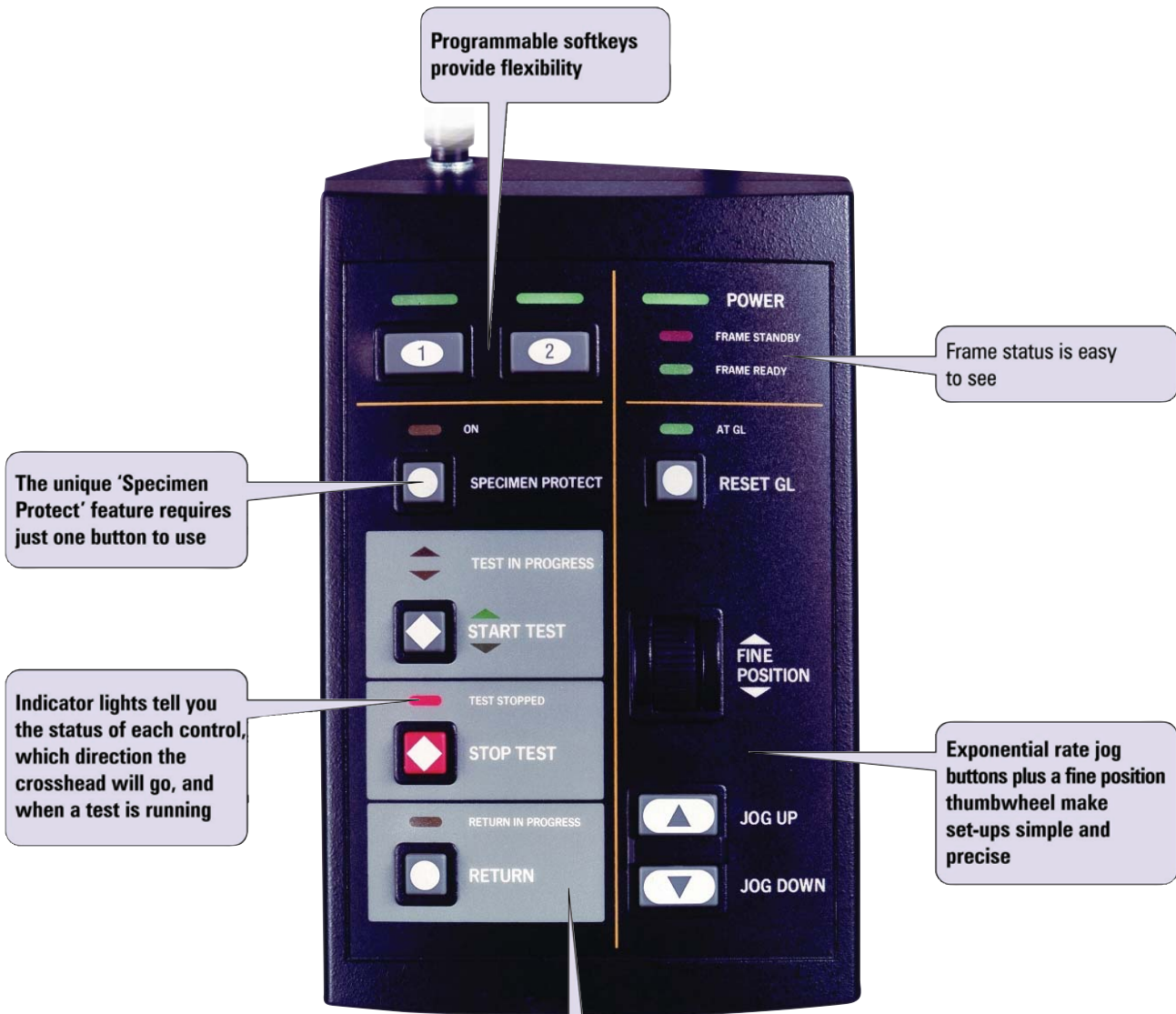


User Interface Designed for Material Testing

As good as the Microsoft® Windows® interface is, it was not designed for materials testing. By combining a control panel with a software console, the 5500 series system provides the optimum in real-time and post-test flexibility. It incorporates many years of testing experience in all types of applications, to give you a tailored, easy-to-use system.

5500 Series Control Panel

The mouse and keyboard are very good input devices for many software applications such as word processing and spreadsheets. However, materials testing instruments require more. The 5500 series control panel provides instant access to the most widely-used materials testing functions, including start and stop, balance, load, reset gauge length and jog.



▲ The 5500 series control panel is designed to work with the Bluehill® 2 console to provide a friendly, flexible user interface. Conveniently mounted on the load frame, this panel provides all the controls you need to run tests.

Status Console - Designed For Simplicity and Safety

Sitting conveniently above the operator's workspace is the intuitive Bluehill[®] 2 status console. The console allows the user to see, at all times, what load is being applied to the specimen under test, which is an important safety feature. The console is user-configurable, and includes soft keys that permit a variety of features ranging from quick auto calibration of the load cell to the set-up of function keys on the user handset (5500 and 5800 and series only).

Prompted Testing for Speed and Efficiency

Bluehill 2's 'Prompted Test' feature provides the industry's most efficient and productive interface for basic testing. With 'Prompted Test', every aspect of the user's interaction with the Bluehill 2 software can be defined. Prompts for user input can be inserted at any point during the test sequence.

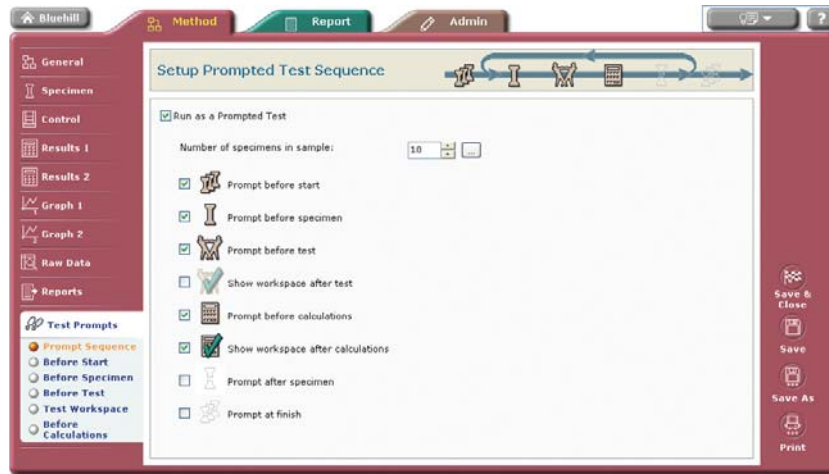
Input and message prompts can appear at six points during the test procedure:

- Before starting test sample/ batch
- Before each specimen test
- Before test
- After test, before calculations
- After specimen
- After sample, at finish

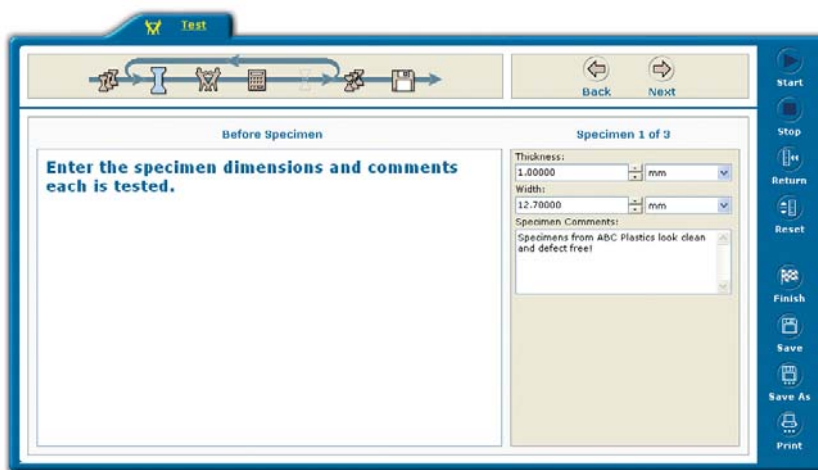
You can also choose to show the runtime workspace after the test or after the calculations are performed.



▲ Status control

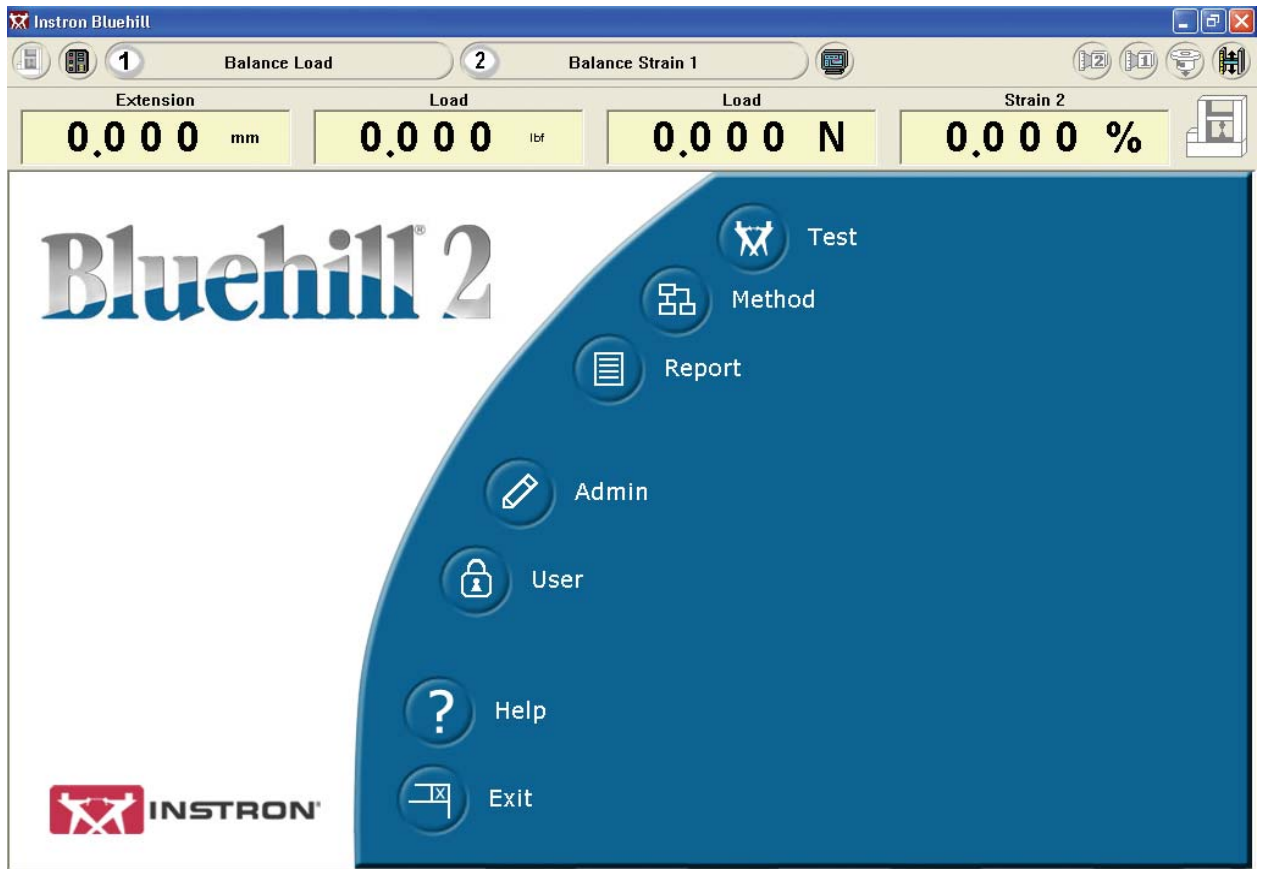


▲ Setting up the 'Prompted Test'



▲ 'Prompt' before the test specimen in testing mode

Simplicity and Power - Bluehill® 2 Software



▲
Bluehill 2 software home page

Unmatched Functionality and Intuitive Operation

Bluehill 2 is a fully-integrated modular software package that provides easy, tailored application solutions for today's laboratory managers and test technicians.

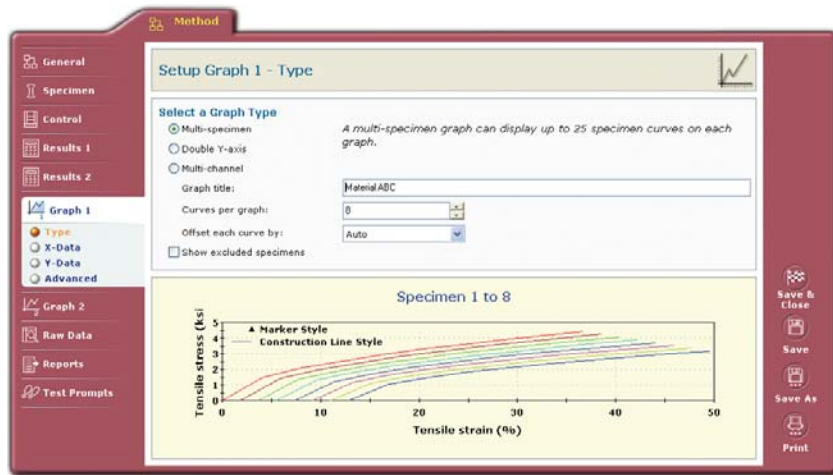
Bluehill 2 provides the most simple and powerful flexible material testing package available along with an intuitive web-like design that users at all levels will find easy-to-use and learn. From the simplicity of a basic peak load test to the power required for a complex cyclic test, users will appreciate the minimum learning and training required.

Bluehill 2 software is divided into color-coded tabs making what you are doing obvious. Screens are tailored to the unique application requirements of each test type. Parameters such as fixture set-up, test terminology, unit choices and calculations are configured automatically, allowing your laboratory to achieve maximum productivity easily and quickly. Bluehill 2's capabilities and design reflect Instron's strong application background, developed almost 60 years ago as a world leader in material testing. Bluehill 2 is directly compatible with a wide variety of Instron systems including the 3300, 4200, 4300, 4400, 5500, 5800 and 8800 series systems.

Have it Your Way

Bluehill[®] 2's simple-to-use, tabbed user interface consolidates testing, test method definition, test reports and system administration, making the entire testing process very easy-to-manage. Click a tab to see your choices, then select what you want to do. It's that simple.

Choose both the manner in which you want the test to run and the content that you want to see. You control everything from the graphic style to the format of the columns in the results table to the layout on the screen. Additionally, you define the type of testing output; from the report format to the results file type and location. It's your test, your way.



▲ Bluehill 2 runtime screen graphics set-up



▲ Bluehill 2 running a test

Superior Frame Design



- A** Pre-loaded ball screws and heavy duty bearings assure long life with zero backlash as well as linear low force and through zero performance. The result is accurate and repeatable measurements that truly represent the specimen characteristics rather than load frame deficiencies.
- B** Robust guidance columns increase lateral stiffness and ensure linear crosshead travel. This results in accurate crosshead alignment thus reducing variability in measurement data and producing better overall accuracy.
- C** Optional second test space allows mounting load cell in stationary position. This eliminates transient load output sometimes seen on low force load cells during initial crosshead acceleration.
- D** Easy-to-clean aluminium column covers with chamfered corners to facilitate access to the test area. Patented T-slots are built in for simple, convenient attachment and positioning of testing accessories.
- E** Drop-through load cell mounting on most models for rapid changes, a larger vertical test space and better load string alignment.

F High torque DC servo-motor with digital closed-loop position controller for more accurate crosshead speed control, rapid acceleration and full speed performance over a wider load range.

G Superior no-clutch design for better reliability, less maintenance and improved load/ speed performance

H Easy to service. All serviceable areas can be reached without tilting, lifting or moving the frame. All cable connections are accessible even when the frame is backed up against a wall.

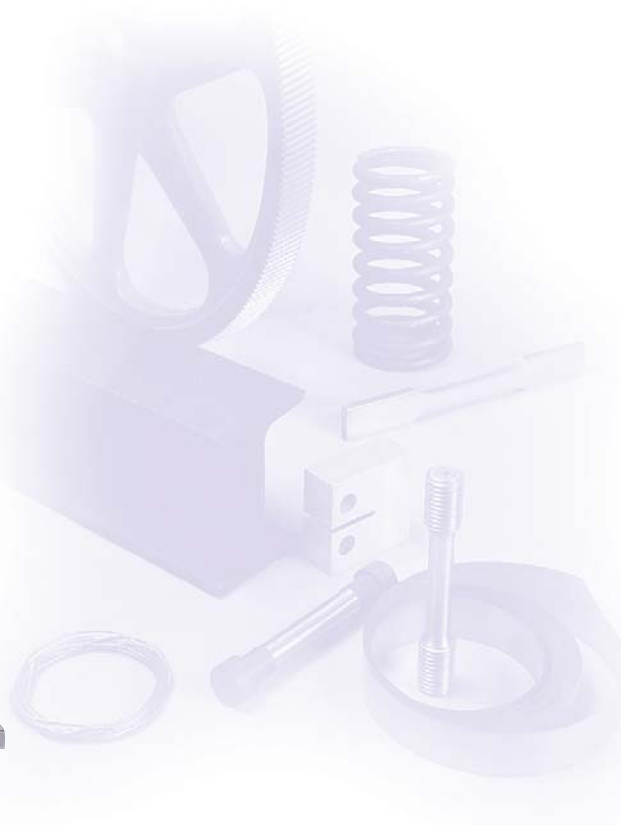
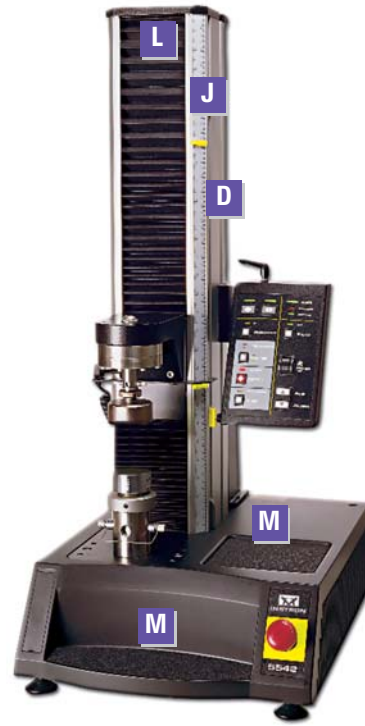
I Optional floor stand with storage drawer.

J Dual action over-travel limits on all frames provide the highest level of safety and meet all international standards.

K Ergonomically positioned electronic connectors for safe and faster set-up.

L Fully-protected lead screw covers provide longer life and greater operator protection.

M Storage areas for specimens, pins, clips and other small items.



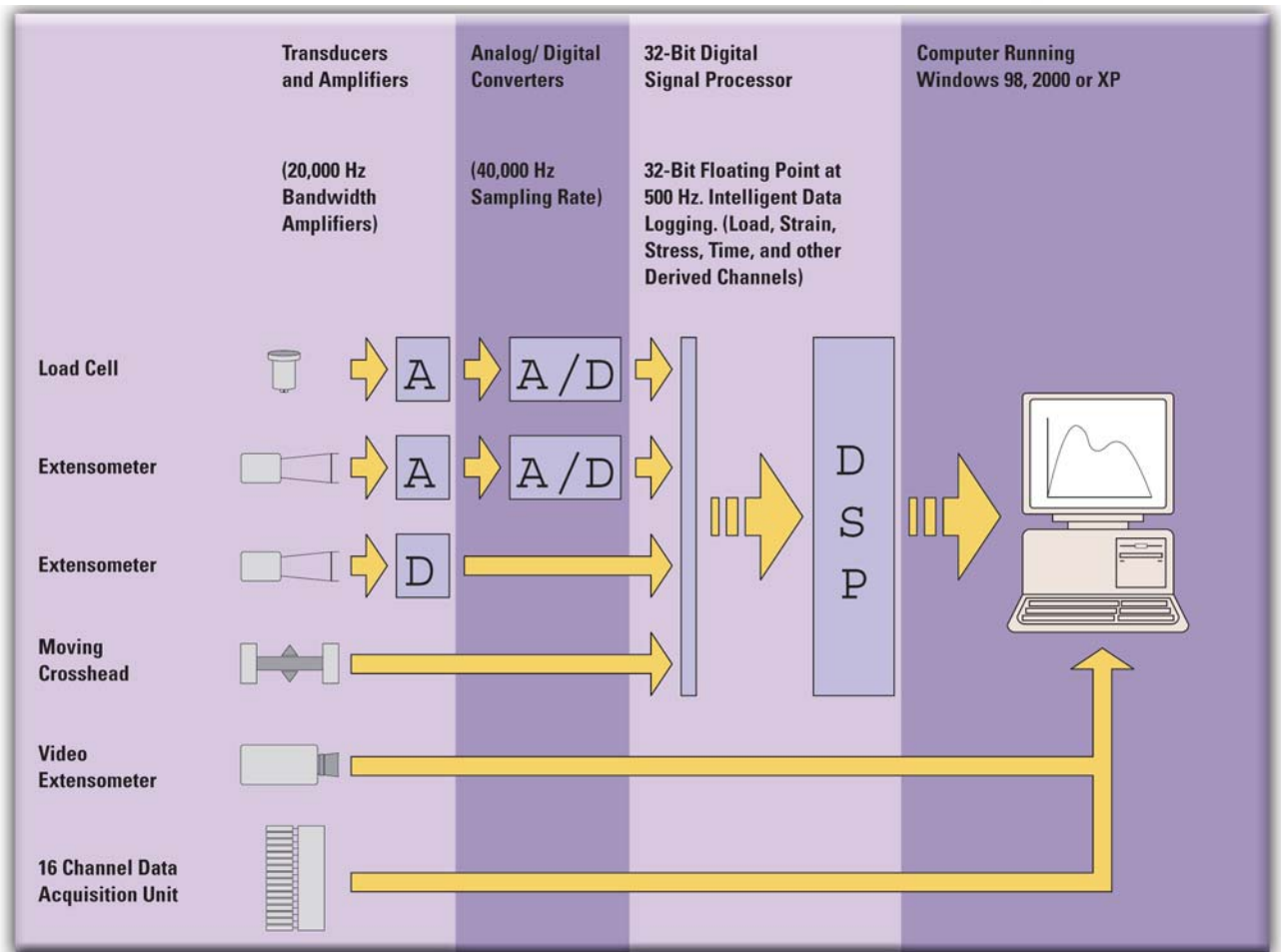
High Accuracy and Exceptional Reliability

Advanced Control Electronics

The 5500 series electronics feature advanced designs that provide fast response, high accuracy and exceptional reliability. A dedicated controller provides accurate point-to-point, high speed data communications with the system's computer without compromising data integrity. The 5500 series controller assumes the burden of realtime control, error and event detection and limit checking, leaving the computer free to perform what it does best - acting as an input device, user interface and storage medium.

Exceptional Resolution

The 5500 series electronics are designed to process and control information efficiently and quickly through the use of a Digital Signal Processor (DSP). The DSP samples all measurement channels at 40 kHz and provides high speed processing of signals with exceptional resolution. It also provides high fidelity closed-loop control with dedicated real time error and limit checking. The controller's firmware program is stored on the computer's hard disk and downloaded to the controller upon initial power up. Firmware control functions can therefore be updated quickly throughout the life of the system without changing hardware components and assures total compatibility with the software application program.



Data Integrity and Reliability

Automatic transducer recognition, calibration and balancing, greatly speeds up the testing process and ensures consistent and accurate data. Maintenance time and costs are minimized and reliability is improved through the use of fewer components, board-mounted connectors and high reliability components. If service is required, on-board diagnostics, a system service log and a data port for remote diagnostics and downloading via modem link, ensure rapid turn around.

The advanced digital design allows synchronous data capture on all channels up to 500 Hz. This means no data skew and the best possible fidelity even during the rapidly changing conditions seen during yield or in peel or tear applications.

Data is stored to the hard disk of the computer during each test. This ensures that results are protected even in the event of a power failure.

Safety

Safety critical functions are handled directly by the controller, independent of the computer. This is the fastest possible response to error conditions and limit triggers. The controller checks for transducer disconnection during the test and stops the crosshead if this occurs. If the computer is shut down or fails, the frame automatically switches to standby mode. Load transducers are automatically protected from overload at 105% of the full-scale value. In addition, user-definable limits may be set within the software.

The 5500 series systems incorporate a specimen protect feature which allows the user to specify a load value above which the system cannot be driven. This is especially useful when setting up delicate or expensive specimens. It can also be used to compensate for thermal expansion of the load string in non-ambient testing applications.

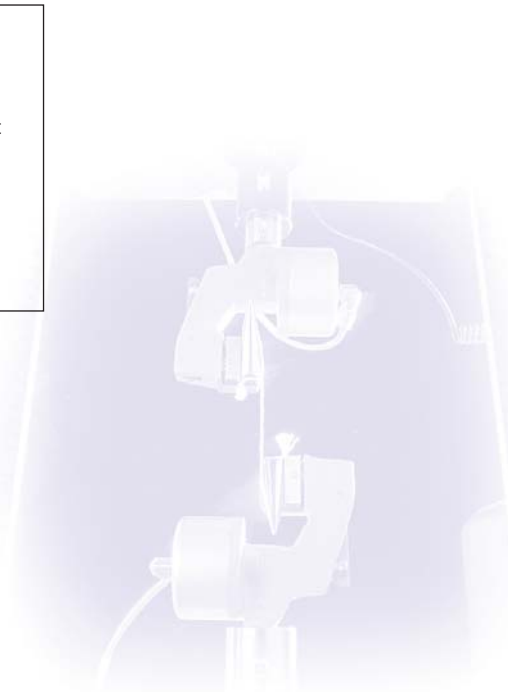
Flexibility

You can further enhance the control and measurement capabilities of a basic system by choosing from a number of optional modules:

- Up to two additional conditioner boards to accommodate additional transducers
- A PC-based 16-channel data acquisition system for additional multiple inputs from devices such as conditioned strain gauges and LVDTs
- An input/output board to provide four ± 10 volt analog outputs for connection to recorders, plotters and oscilloscopes
- Four digital inputs for synchronization with external event detectors and four digital outputs for triggering external equipment
- Grip controls to provide automatic opening and closing of pneumatic grips

Technical Specifications

Data Sampling Rate	40 kHz
Data Capture Rate	Selectable up to 500 Hz. intelligent data capture, synchronous on all channels.
Digital Signal Processor	32-bit floating point, downloadable firmware, self-test diagnostics, real-time system status, real-time closed-loop control, real-time data acquisition
Data Transfer to PC	750 k baud high speed serial link
Transducer Inputs	Standard Instron rationalized transducers, any 0 to 10 V analog DC input



Custom Frame Options

A range of load frame options provide even greater applications coverage to the 5500 series. Extra wide frames allow tests on components and finished articles as diverse as automotive parts and beds. High elongation elastomers, cables and pipes can be catered for by a range of extra height options. A dual test space option is available on most models to allow different fixture set-ups to remain permanently installed for enhanced productivity or to allow the load cell to be installed in a stationary crosshead in low force applications such as fiber testing.

Instron® can provide load frames designed specifically for your application including horizontal machines for cable testing, reduced height machines for confined spaces and systems for use in radioactive hot cells or other environments.



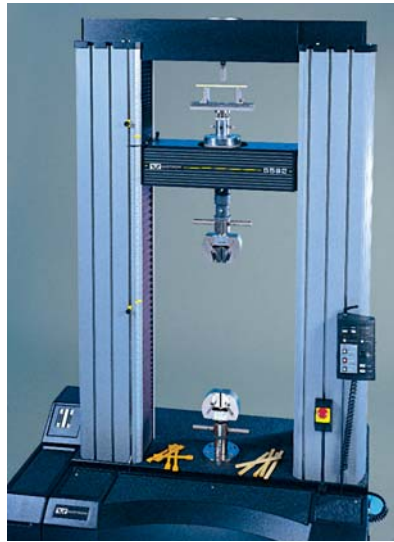
▲ Multiple load strings for high volume test applications



▲ Specially designed frames for asphalt testing applications



▲ Extra wide frame ideal for testing large components



▲ Dual test space reducing set-up time



▲ Extra high variants to suit long or highly extensible specimens

Accessories

Accessories and System Enhancements

Whatever testing you need to do, Instron® can supply grips, fixtures and other accessories or enhancements to help solve your measurement requirements. As your needs change in the years to come, a 5500 series system can readily adapt to keep pace. Examples include:

Specimen Grips

- Screw action grips
- Elastomeric grips
- Cord and yarn grips
- Wedge action grips
- Hydraulic grips
- Pneumatic grips
- And many others

Extensometry

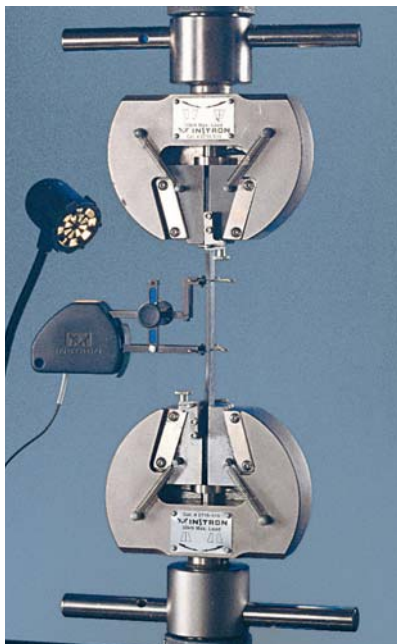
- Video extensometers
- Clip-on strain gauge extensometers
- Elastomeric long travel extensometers
- High Resolution Digital (HRD) automatic extensometers
- Linear Variable Displacement Transducers (LVDT)

Special Purpose Fixtures

- Food testing fixtures
- O-ring test fixtures
- Friction testing fixtures
- Peel test fixtures
- Flexure fixtures
- Compression fixtures
- Composite material testing fixtures
- T-slot tables
- And many others

Environmental Chambers

- High and low temperature
- Furnaces and cryostats
- High and low temperature accessories



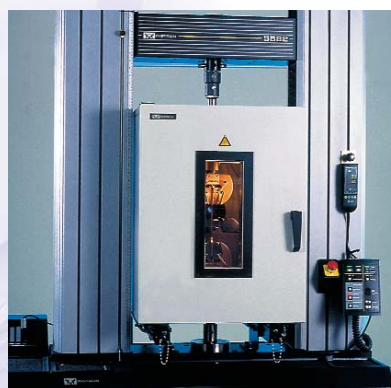
▲ Wedge grips with clip-on extensometer



▲ Pullout storage drawer



▲ T-slot table



▲ Environmental chamber

Extra™ Instron® Services Revolve Around You

Nobody knows material testing like Instron, and nobody knows more about the capabilities of your Instron system than Extra Instron Services. Instron has been driving product development, quality control, and research for companies since 1946. Put this experience to work for you to improve the strength, extend the lifespan, reduce costs, increase reliability, improve the safety, and refine your products and processes to maintain and improve your competitive position. We offer a variety of services to get the most out of your investment, extend the life of your Instron system and provide you with traceable results to worldwide standards.



▲ Web support

The Extra Instron Services offerings include:

- Web support
- Telephone support
- On-site support
- Software support
- Calibration support
- Training and consultancy
- Life Cycle management

Flexible service agreements can be configured to meet your needs. You also have the option of extending the Extra Instron Services umbrella to include other brands of testing systems. You can trust your testing system to us, whatever the brand, so you get full service coverage for your entire laboratory from the most trusted name in material testing.

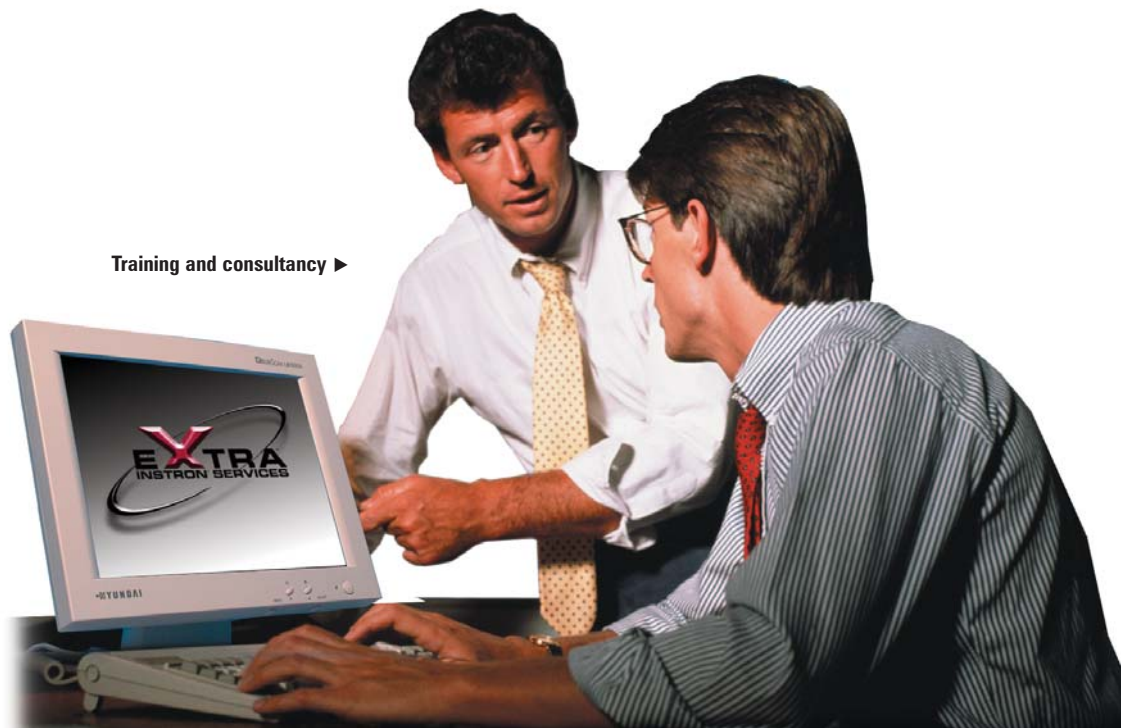
Extra Instron Services is a global organization with extensive coverage to respond promptly to your service needs. Our field service engineers are highly-trained, have many years of experience in the material testing field and understand your testing needs. They are fully certified, ready to answer questions and protect your investment by proactively maintaining your system to ensure that it is running at its peak.

Put Instron's experience to work for you. Get the most from your material testing system. Go to the support and services section on www.instron.com to learn more.



▲ Telephone support

Training and consultancy ►



Specifications

		Single Column Table Top Models			Twin Column Table Top Models					Floor Standing Models			
		5542	5543	5544	5564	5565	5566	5567	5569	5581	5582	5584	5585H
Load Capacity	kN	0.5	1	2	2	5	10	30	50	50	100	150	250
	kgf	50	100	200	200	500	1000	3000	5000	5000	10000	15000	25000
	lbf	112.5	225	450	450	1125	2250	6750	11250	11250	22500	33750	56200
Maximum Speed	mm/ min	1000	1000	1000	2500	1000	500	500	500	1000	500	750	500
	in/ min	40	40	40	100	40	20	20	20	40	20	30	20
Minimum Speed	mm/ min	0.05	0.05	0.05	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	in/ min	0.002	0.002	0.002	0.0002	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004
Maximum Force at Full Speed	kN	0.5	1	2	1	5	10	30	25*	35	75	110	100
	lb	112.5	225	450	225	1125	2250	6750	5620	7870	16860	24730	22500
Maximum Speed at Full Load	mm/ min	1000	1000	1000	1000	1000	500	500	250**	500	250	375	200
	in/ min	40	40	40	40	40	20	20	10	20	10	15	8
Return Speed	mm/ min	1500	1500	1500	2500	1200	600	600	500	1000	600	800	500
	in/ min	60	60	60	100	48	24	24	20	40	24	32	20
Position Control Resolution	μm	0.156	0.156	0.208	0.236	0.118	0.057	0.054	0.063	0.100	0.060	0.075	0.060
	μin	6.1	6.1	8.2	9.3	4.6	2.2	2.1	2.5	3.9	2.4	2.9	2.4
Total Crosshead Travel	mm	500	917	917	1135	1135	1135	1135	1135	1235	1235	1180	1180
	in	19.7	36.1	36.1	44.6	44.6	44.6	44.6	44.6	48.6	48.6	46.5	46.5
Total Vertical Test Space ^{Note 5}	mm	659	1076	1076	1249	1249	1249	1205	1205	1309	1309	1256	1256
	in	25.9	42.4	42.4	49.2	49.2	49.2	47.4	47.4	51.5	51.5	49.4	49.4
Depth Daylight	mm	100	100	100	NA	NA	NA	NA	NA	NA	NA	NA	NA
	in	3.9	3.9	3.9									
Space Between Columns	mm	NA	NA	NA	420	420	420	420	420	575	575	575	575
	in				16.5	16.5	16.5	16.5	16.5	22.6	22.6	22.6	22.6
Height ^{Note 7}	mm	875	1275	1275	1597	1597	1597	1597	1597	2092	2092	2092	2092
	in	34.4	50.2	50.2	62.9	62.9	62.9	62.9	62.9	82.4	82.4	82.4	82.4
Width	mm	375	375	375	909	909	909	909	909	1300	1300	1300	1300
	in	14.75	14.75	14.75	35.8	35.8	35.8	35.8	35.8	51.2	51.2	51.2	51.2
Depth	mm	500	500	500	700	700	700	700	700	756	756	756	756
	in	19.7	19.7	19.7	27.5	27.5	27.5	27.5	27.5	29.8	29.8	29.8	29.8
Weight	kg	32	37	37	136	136	136	182	240	862	862	952	952
	lb	70	80	80	300	300	300	400	530	1900	1900	2100	2100
Maximum Power Requirement	VA	225	225	400	300	300	300	600	700	1400	1400	2800	2850 VA

Note: Common specifications are on the back page



Common Specifications

Position Measurement Accuracy: ± 0.02 mm or 0.05% of displacement (whichever is greater)

Crosshead Speed Accuracy (Zero or constant load): $\pm 0.1\%$ of set speed

Load Measurement Accuracy: $\pm 0.4\%$ of reading down to $\frac{1}{100}$ of load cell capacity, $\pm 0.5\%$ of reading down to $\frac{1}{250}$ of load cell capacity

Strain Measurement Accuracy: $\pm 0.5\%$ of reading down to $\frac{1}{50}$ of full range with ASTM E83 class B or ISO 9513 class 0.5 extensometer

Single Phase Voltage: For 5581, 5582, and 5584 - 100, 120, 220, or 240 VAC $\pm 10\%$; For the 5585H 200/208, 220, 230, 240 VAC $\pm 10\%$, 47 to 63 Hz. Power supply must be free of spikes, surges or sags exceeding 10% of the average voltage.

Operating Temperature: $+10$ °C to $+38$ °C ($+50$ °F to $+100$ °F)

Storage Temperature: -40 °C to $+66$ °C (-40 °F to $+150$ °F)

Humidity Range: $+10\%$ to $+90\%$, non-condensing

Atmosphere: Designed for use under normal laboratory conditions.

Protective measures may be required if excessive dust, corrosive fumes, electromagnetic field or hazardous conditions are encountered.

- Notes:**
1. Load weighing system meets or surpasses the following standards: ASTM E 4, BS 1610, DIN 51221, ISO 7500-1, EN 10002-2 and AFNOR A03-501. Instron® recommends that systems are verified on site at the time of installation as required by ASTM E 4 (par. 20.3) and ISO 7500-1 (section 9) standards.
 2. Strain measurement system meets or surpasses the following standards: ASTM E 83, BS 3846, ISO 9513, EN 10002-4.
 3. Extra high or wide load frames and extra high or low speed drive systems are also available. Contact your nearest Instron office for details.
 4. These systems conform to all relevant European standards and carry a CE mark.
 5. Total vertical test space is the distance from the top surface of the base platen to the bottom surface of the moving crosshead, excluding load cell, grips and fixtures.
 6. The single column system dimensions and weights above do not include the 5500 Series control electronics module. The dimensions of this module are 205 mm (width) x 380 mm (length) x 300 mm (height) (8 in x 14.9 in x 11.8 in). Its weight is 7.7 kg (17 lb).
 7. Add 295 mm (11.6 in) to 5581, 5582, 5584 and 5585 heights when the optional 2910-061 load frame support base/ extension is included.

The above specifications were developed in accordance with Instron's standard procedures and are subject to change without notice.

*50 kN (11250 lb) with line voltage of 220 V or 240 V.

** 500 mm/min (20 in/min) with line voltage of 220 V or 240 V.

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