C224-E053D

SHIMADZU
Excellence in Science

Precision Universal Tester

Autograph AG-X plus Series

Autograph AG-X plus Series

Precision Universal Tester

Reliable, stress-free workflow

Power savings (power consumption during standby) 10 to 25% less than for conventional models

The Shimadzu Autograph AG-X plus series delivers high-level control measurement performance utilizing technologies developed from conventional models. In addition, development focused on intuitive operation and convenient support functions.
Furthermore, power savings functionality is provided as standard, as a means of lessening environmental load. As a result, power consumption during standby is 10 to 25% less in comparison to conventional models. The lineup also includes a new short-column (SC) type and high-speed (HS) type. In addition to the very popular Smart Controller featured on conventional models, the controller features a color LCD touch panel screen for PC-free operation. The TRAPEZIUM X computer software has also been newly developed, using cutting edge Microsoft.Net technology to enhance user-friendliness.
Shimadzu's new AG-X plus series advances testing in three areas: performance, operability, and support.

JCSS

- Shimadzu is accredited (JIS Q 17025, ISO/IEC 17025), based on JCSS, as a calibration agency for uniaxial testing machines.JCSS cross-certifies with America's NVLAP and other certification standards throughout the world, ensuring world-wide traceability.
- These products are CE compliant.
- AG-X plus units are manufactured by professionals at ISO9001 certified factories, ensuring years of worry-free operation.

01 Superior Performance ▶ p 4

High resolution and reliable control ensure reliable collection of necessary data.

02 Worry-Free User-Friendliness ▶ p 6

Easy-to-use functions ensure smooth, trouble-free testing.

03 Quest for Convenience ▶ p 8

TRAPEZIUM X streamlines testing and eliminates confusion.

AG-X plus

The door to the future

01 Superior Performance

Short-Column (SC) type is suitable for testing with a small specimen

This model is suitable for compression and other testing of small electrical and electronic parts. The total height of the testing machine is 1130 mm, which means it can be installed in a room with a low ceiling. The testing space is 700 mm.

Shorter testing cycle time

A high-speed, 5 kN max. table-top design can now be selected, with a return speed of 3300 mm/min, and a crosshead speed of 3000 mm/min. This model can significantly shorten the test cycle time for rubber and other very stretchy specimens.

Up to 25% Environmental load reduced by saving power during standby

Reducing CO_2 emissions is a global necessity. The AG-X plus helps to lessen environmental load by reducing power consumption during standby. Power consumption is reduced by 10 to 25% depending on the frame capacity.

Easy control of stress and strain

Auto tuning of control parameters is now possible in real time, based on measured test force and strain data. Comparisons can be safely made with unknown sample data, without the need for preliminary tests.Strain control, an ISO6892-2009 requirement, is easily performed with the autotuning function.

Iron and steel sector

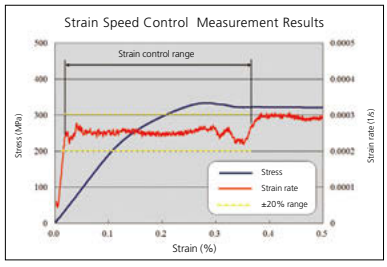
(1) In addition to conventional stress control, tensile testing with strain control is increasingly in demand.

Resins sector

(2) Measuring the modulus of elasticity in the ultra-small strain domains proscribed by JIS and ISO standards has become a necessity.

Ceramics sector

(3) Many samples are damaged by microscopic displacements, so accurate control is needed, right from the start of testing.



Strain Control Test Example

Ultrahigh-speed sampling ensures no missed strength changes

Ultrahigh-speed 0.2 msec. (5 kHz) sampling ensures that sudden test force changes often seen at the start of testing can all be recorded. Easily change sampling condition settings during testing to investigate important regions in detail.

Control resolution has been improved by a factor of 8, enhancing the reliability of test results

Test results are sensitive to speed control resolution, particularly in the low-speed domain. The AG-X plus features unprecedented high resolution and reliable control, improving the reliability of required test results.

Accurate S-S Curves are achieved with highly precise load cells

Improve testing efficiency and ensure that virtually all of your testing can be performed without switching the load cell or jig, as a result of the wide, guaranteed load cell precision range of 1/1000 to 1/1.

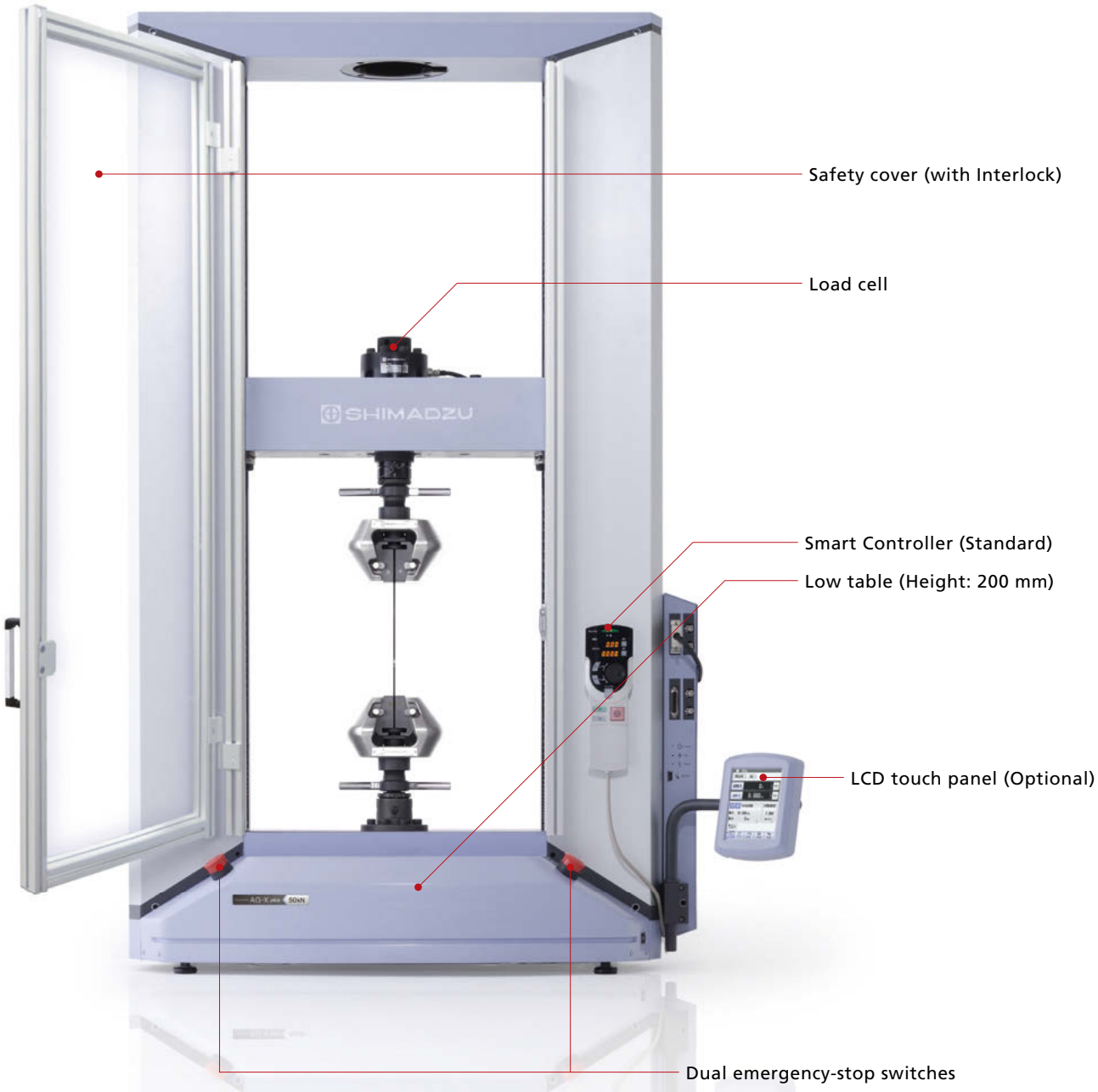
Convenient testing of actual objects

Up to 12 channels of data can be simultaneously read by a PC for immediate analysis. Test force readings along with data from multiple strain gauges may be collected during testing of actual objects.
Dedicated digital cable makes measurement possible by connecting to a digital gauge.

Worry-free and reliable

A highly rigid frame is an indispensable aspect of high-function testing machines. The AG-X plus frame has been redesigned based on the latest design concepts. A crosshead guide has been adopted for all models, whether floor mounted or table top, significantly enhancing torsional rigidity in comparison to conventional models.

02 Worry-Free User-Friendliness

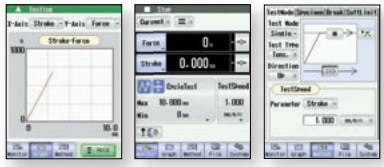


Store test methods in USB memory

After storing testing methods on a USB memory device, simply insert the device into the testing machine to perform testing without a PC. Measurement data can also be automatically saved to USB memory. After testing, bring your USB memory device back to your office PC to analyze data and create reports. (Requires LCD touch panel and TRAPEZIUM X software.)

Perform testing without a PC

An optional LCD touch panel means you can quickly select testing methods without having to connect a PC. Easily view graphs of data directly on the LCD screen.



Control at your fingertips - easy operation and data confirmation

With the Smart Controller, confirmation of test force and position real-time data is at your fingertips. Easily perform Start, Stop and other basic operations via this controller, and use the convenient jog wheel to adjust jig position in fine increments during bending and compression. You can even open or close the air chucks during tensile tests and operate the automatic extensometer.

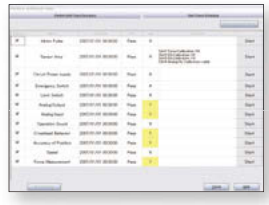
Safety equipment

- **Safety cover**
  This cover is designed to control scattering of the test specimen during testing and the interlock improves operation safety.
- **Safety functions**
  If force changes exceed a certain level during specimen setting or return, the testing machine is stopped by the safety function.
- **Dual emergency-stop switches**
  As a safety measure, emergency-stop switches are provided on both sides.

Safety cover (option) attached

Self-diagnostics help cover all bases

Self-check function (12 items, including motor pulse, sensor amplifier, and board power supply) confirms that the instrument is in perfect working order. If desired, notification of pre-set maintenance periods is also possible.
(Some check items require a special jig.)



Simple load cell installation (option)

Use this load cell quick attach/release unit with the table-top type 10 kN capacity AG-X unit, which usually requires frequent load cell changes.
AG-X units with a capacity of 20 kN or more can attach the optional small-capacity load cell attachment plate to the bottom of the crosshead, eliminating the need to detach the original load cell.

Load cell attach/release
(10 kN type)

Floor model
(with small-capacity load cell attached)

03 Quest for Convenience

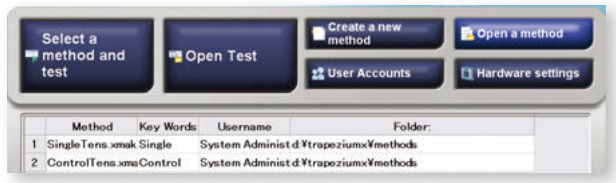
Materials Testing Operation Software

TRAPEZIUM X

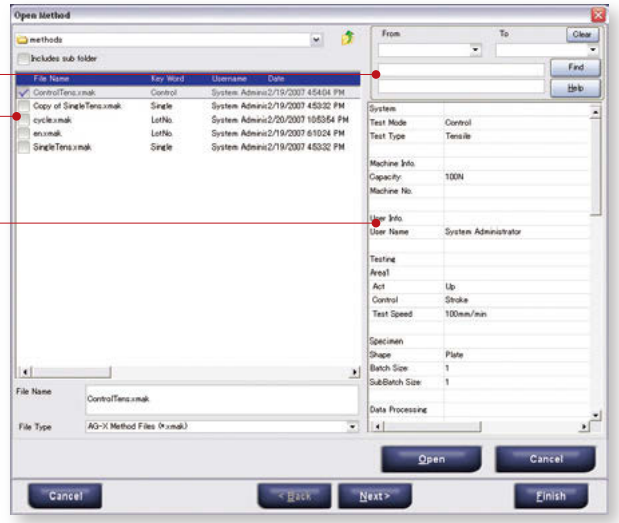
Intuitive machine operation

1. Perform high-efficiency, continuous testing because of fast data searches and one-touch method selection.

- Start testing in just one step after frequently-used methods are recorded in the Quick Method List.

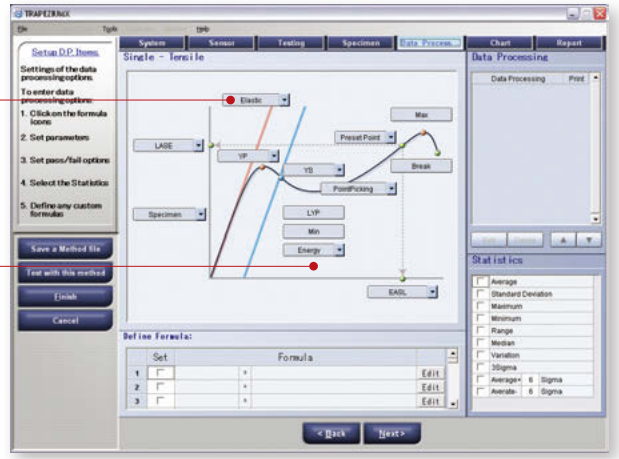


- Use a key word or date to quickly search for saved test results and Method files. Also, easily call up files using previews of reports and lists of settings.



2. Visual wizard guidance ensures trouble-free entry of method settings

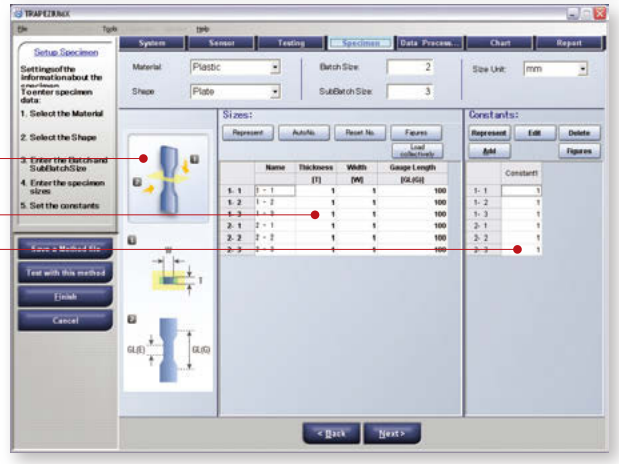
- Complicated method settings can be entered using the Method Wizard, which provides an overview of the entire process.
- Setting entry guidance, linked to online help, is available in each window.
- Easy-to-understand illustrations are used in the [Testing], [Specimen] and Data Processing] windows, greatly simplifying the entry of settings.



Data processing settings (single software: plastic material)

1 General data processing items are prepared in advance. Simply press buttons on the figure to select settings.

2 Illustrations change according to the test mode and specimen material. Use a key word or date to quickly search for saved test results and Method files.
Also, easily call up files using previews of reports and lists of settings.



Specimen quantity and size settings window

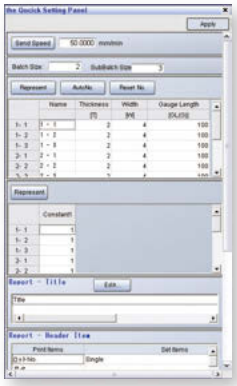
3 Illustrations are displayed for each specimen shape. A single glance shows which dimensions should be entered.

4 In addition to manual input, dimensions can also be set via [Excel batch reading] or [Automatic input via calipers].

5 Additional, non-dimensional information can also be entered for each specimen.

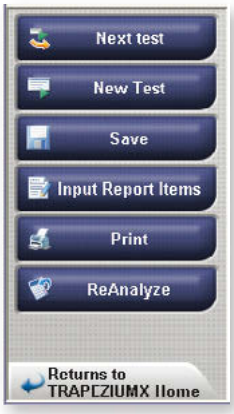
Receive data quickly

1. Speed, dimension, and report information can be entered quickly and directly from the main window using the [Quick Panel].



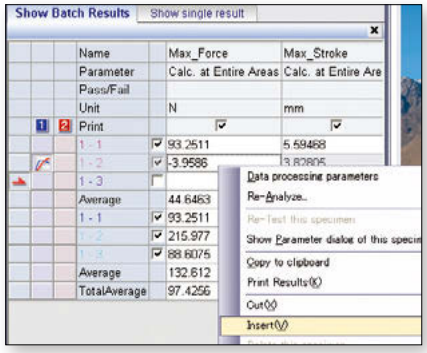
2. Advanced navigation system with learning functions

- AG-X is equipped with a Navigation Bar that shows only the functions required for a selected situation. This allows you to efficiently perform continuous testing using simple, straightforward procedures and by pressing large,
  easy-to-read buttons.
  AG-X is also equipped with a "Learning function" that records user actions for each situation and adds
  frequently-used functions to the Navigation Bar. This means that the more you use the machine, the better the "fit" is to your unique operation style, effectively speeding up your workflow.



3. Functions include re-test, file synthesis, as well as specimen insertion, addition and order changes in any position.

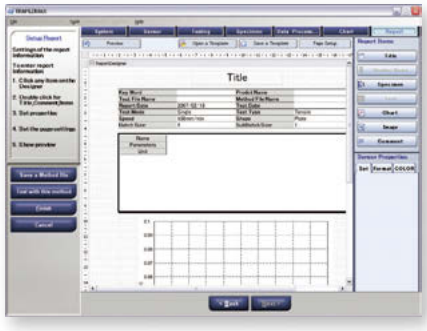
- Re-test: A portion of a batch test can be retested, and the prior test results replaced.
- Extra lot tests: batches (lots) can be added, increasing the total number of tests.
- A variety of setting changes are possible before and after testing. Specimens can be inserted in any position or added to only a specific batch, and the specimen order can be changed after testing is completed.



Generate detailed reports

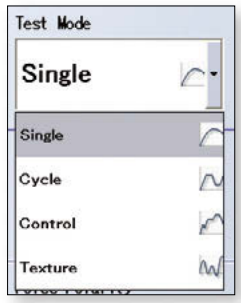
Richly expressive report creation includes free positioning of report elements and a wealth of web-compatible output functions.

- **Report Designer allows flexible layout**
  Create reports that include test data, charts, photographs and logos.
  Freely change report layout and element sizes.
  Use detailed settings for each element's font, color and ruled lines.
- **Reports can be output in PDF, Microsoft Word, Excel and HTML formats.**
  Output reports created with Report Designer in a wide variety of useful formats.
  (Charts and tables with ruled lines cannot be output in Word and HTML.)
  After export, use your everyday software to customize the report.
- **WebPlus function (option)**
  Installing the WebPlus option on your server PC allows reanalysis and printing via Internet Explorer, even on a PC not equipped with TRAPEZIUM X.



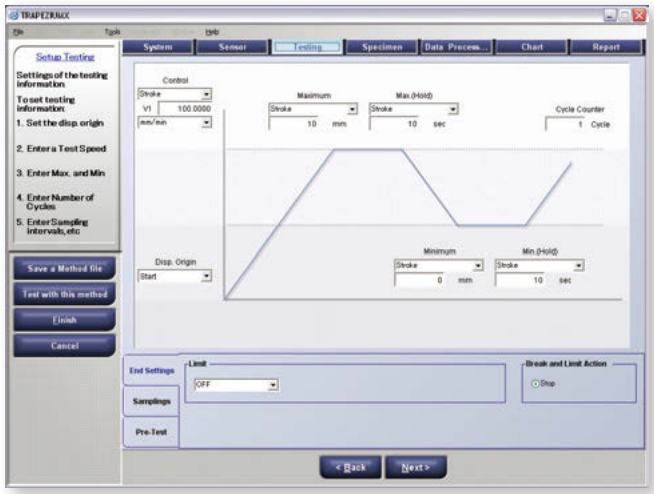
Choose from four software components to fit your specific application

TRAPEZIUM X includes four software components - Single, Cycle, Control and Texture.
This allows you to purchase only the components that meet your specific testing needs. When multiple software components are purchased, easily switch between modes at a single touch, without starting up separate software.

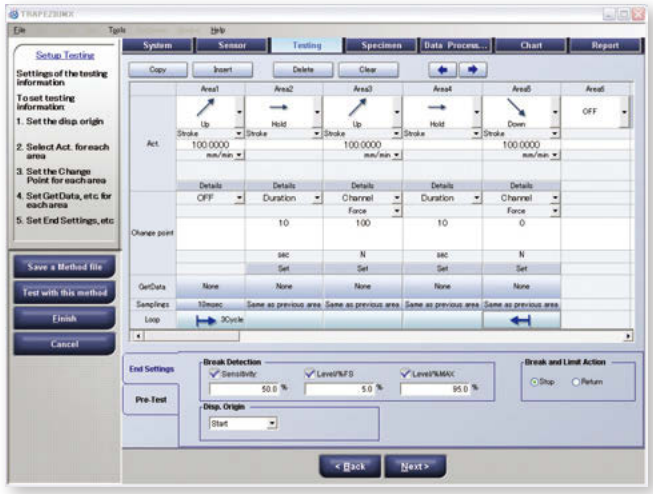


- **Single software**
  Performs general single-direction testing.
  Examples include tensile, compression, bending and peeling tests.

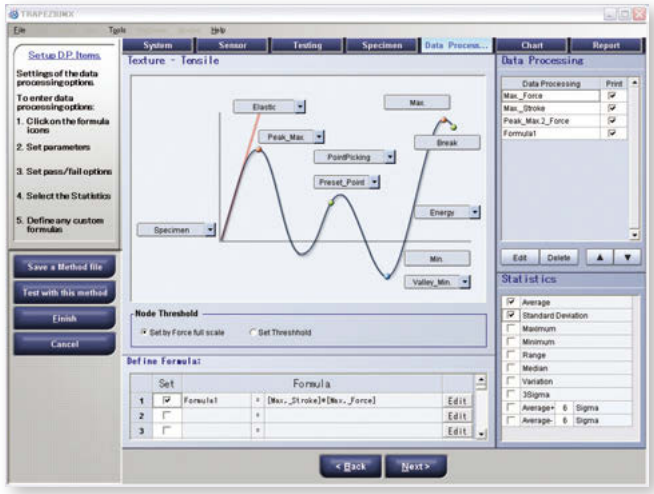
- **Cycle software**
  Similar to endurance testing, this software is used for testing where force is repeatedly applied and then released.



- **Control software**
  Create any testing machine operation pattern. Perform foam rubber compression and holding cycle tests.



- **Texture software**
  Measures the features (texture) of foods and pharmaceuticals. Produce special data processing results, including mastication, jelly strength and adhesion.



Accessories

Experience the range of possibilities available with this full-featured system

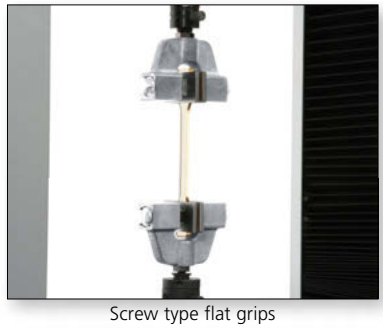
Accessories Lineup

Tensile tests

Combine grips and extensometers with the testing machine.

- **Grips**
  Used to grip the sample, a wide variety is available to accommodate different specimen types and test force amounts.


Non-shift wedge type grips


Screw type flat grips


Pneumatic flat grips

Non-shift wedge type grips <MWG> Applications: ●Plastics, ●Metals, ●Wood

Grip capacity	Standard grip face				Upper grip capacity (kg)
	Grip face	Clearance (mm)	Grip width (mm)	Grip length (mm)	
300 kN	File teeth for flat specimens	0 to 8.5	50	75	33
250 kN		0 to 8.5	50	75	33
100 kN		0 to 7	40	55	10
50 kN		0 to 7	40	55	9.5
20 kN		0 to 7	25	55	3.6
5 kN		0 to 7	25	55	3.6

Screw type flat grips <SCG> Applications: ●Rubber, ●Plastics, ●Textiles, ●Cloth, ●Paper

Grip capacity	Standard grip face				Upper grip capacity (kg)
	Grip face	Clearance (mm)	Grip width (mm)	Grip length (mm)	
5 kN	File teeth	0 to 16	60	50	2
1 kN		0 to 15	50	30	0.7
50 N	Flat	0 to 14	35	25	0.3

Pneumatic flat grips <PFG> Applications: ●Rubber, ●Plastics, ●Textiles, ●Cloth, ●Paper

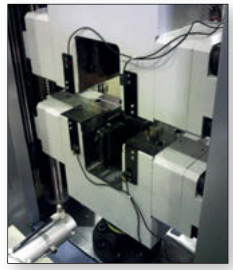
Grip capacity	External dimensions (mm)		Grip width (mm)	Clearance (mm)	Upper grip capacity (kg)
	W	L (upper/lower)			
10 kN	154	268.5 / 278.5	60	0 to 10	—
5 kN	154	224 / 235	60	0 to 6	5.7
1 kN	102	163 / 174	50	0 to 6	1.7
50 N	64	118 / 135	35	0 to 6	0.4

*1 Grips with foot-valve units and crosshead–linked control functions are also available.
*2 Grips can be opened and closed via the Smart Controller when using the crosshead-linked control kit.

Grips and devices for testing actual objects

Hydraulic parallel tightening grips

Reduces the initial testing force when the specimen is mounted.



Grip capacity	External dimensions (mm)		Grip width (mm)	Clearance (mm)	Upper grip capacity (kg)
	W	L (upper/lower)			
300 kN	600	365 / 365	60	0 to 60	170
100 kN	450	260 / 260	40	0 to 40	90

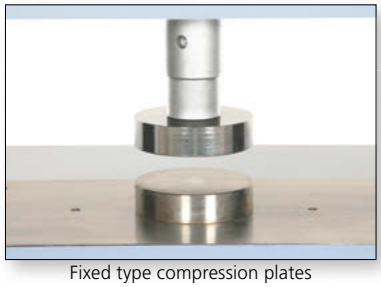
Pneumatic capstan type grips

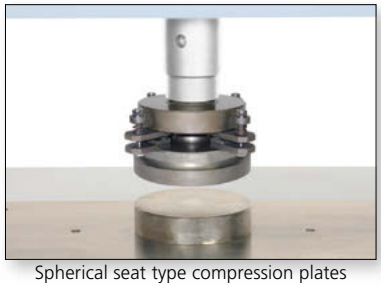
Grip capacity	External dimensions (mm)		Initial tension	Clearance (mm)	Upper grip capacity (kg)
	W	L (upper/lower)			
5 kN	240	230 / 240	Spring type 0.2 to 2 N	0 to 8	7.8
1k N / 500 N	140	165 / 165	Spring type 0.2 to 2 N	0 to 3	1.5
50 N	65	100 / 140	Weight type 0.005, 0.05, 0.1 N	0 to 3	0.3

Compression tests

Simply attach the compression plate kit to the main unit to perform compression testing.

- **Compression plate kit** Applications: Plastics, Metals, Rubber, Wood, Cement
  Used to compress the specimen, several types are available to accommodate different specimen types and test force amounts.


Fixed type compression plates


Spherical seat type compression plates

Fixed type

Maximum capacity	Upper plate dimensions (mm) diameter by thickness	Upper plate mass (kg)	Operational temperature (C)
250 kN	ø100 × 25	1.6	0 to 40
	ø50 × 25	0.5	
	ø200 × 40	6.3	

Spherical seat type

Maximum capacity	Upper plate dimensions (mm)	Upper plate mass (kg)	Operational temperature (C)
250 kN	ø100	3.8	0 to 40

* With spherical compression plates, only the upper plate is spherical.
Spherical seat-type compression plates provide contact flexibility for uniform load application.

Bending tests

Simply attach the bending test jig kit to the main unit to perform bending testing.

- **Bending test kit**
  Select the kit number appropriate for the load cell used.

Max. test force	Punch tip radius x width (mm)	Support tip radius x width (mm)	Support spacing (mm)	Operational temperature (C)	Applicable test standards
10 kN	R5 × 34	R2 × 34	20 to 200	0 to 40	JIS K6911, JIS K6902*1, JIS C6481*2, JIS K7171, ISO 178, Specimens with thickness of 3 mm or less
		R5 × 34			JIS K7171, ISO 178, Specimens with thickness above 3 mm
	R1/8" × 72	R1/8" × 110	0.8 to 8"		ASTM D790 (Test method 1)
100 kN	R5 × 72	R2 × 110	50 to 500		JIS K6911, JIS K6902*1, JIS C6481*2, JIS K7171, ISO 178, Specimens with thickness of 3 mm or less
		R5 × 110			JIS K7171, ISO 178, Specimens with thickness above 3 mm
	R1/8" × 72	R1/8" × 110	2 to 20"		ASTM D790 (Test method 1*3)


3-point bending test of plastic specimen

*1 Corresponds to bending strength. Compatible with support spacing from 20 mm to 200 mm.
*2 Corresponds to bending strength.
*3 Compatible with support spacing from 2 inches to 20 inches.

When the SIE or SES extensometer is used, the following adaptor is required.
346-55658-XX

Adhesion test

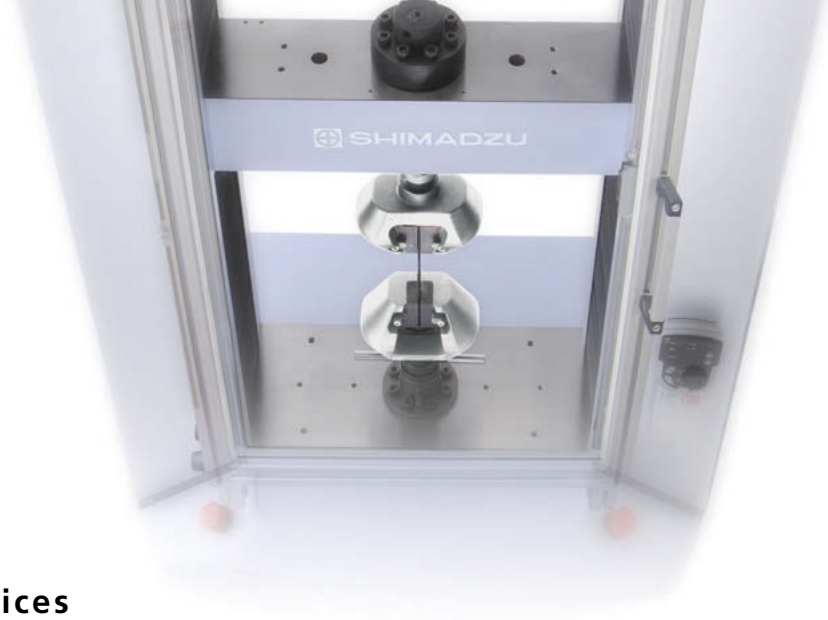
- **Adhesive tape peeling test device** Applications: Plastics, Rubber
  Specimen table slides in accordance with upper grip movement to maintain a 90 degree peeling angle.

Upper grip: 1 kN Flat screw type, 1 unit

Capacity	Applicable specimen (width × thickness mm)	Operational temperature (C)	Applicable test standards
1 kN	50 × 5 to 2	-10 to +60	JIS Z0237 Adhesive tape Adhesive tape test method (90° peeling test) JIS Z1528 Double-sided adhesive tape adhesion

Mechanism differs from JIS example.
For details on test jigs not listed in this catalog, please refer to the separate Accessories catalog.

Accessories



Displacement measuring devices

Extensometers

Extensometers improve elongation measurement accuracy.

• Shimadzu TRViewX Non-Contact Digital Video Extensometer

	Model	Camera Field-of-View (GL + elongation)
Single camera (TRViewX S Series)	TRViewX55S	55 mm*1
	TRViewX120S	120 mm*1
	TRViewX240S	240 mm*1
	TRViewX500S	500 mm
	TRViewX800S	800 mm

	Model	Camera Field-of-View (GL + elongation)
Double camera *2 (TRViewX D Series)	TRViewX500D	Camera 1: 120 mm *1 Camera 2: 500 mm
	TRViewX800D	Camera 1: 120 mm *1 Camera 2: 800 mm

*1. Elongation accuracy at normal temperatures is JISO Class 0.5 compliant.
*2. With the double camera model, camera 1 takes measurements with a field of view up to 120 mm, beyond which the system switches to camera 2. Select models 500D/800D if you require a wide field of view (500 mm/800 mm) and Class 0.5 compliance up to a 120 mm field of view.

• Strain gauge type one-touch extensometer <SSG-H Series>

SSG-H series extensometers conform to JIS B7741 Class 0.5 and JIS K7161 (SSG 50-10SH only).
They can be attached using just one touch.

Model	Gauge length (mm)	Measuring range (mm)
SSG25-50H	25	12.5 5.25 2.5 1.24
SSG25-100H	25	25 12.5 5 2.5
SSG50-10H	50	5 2.5 1 0.5
SSG50-10SH	50	5 2.5 1 0.5

* Calibration cables (for SGI) are included with each kit.
* Precision is JIS B7741 Class 0.5 or Class 1, depending on the conditions.

Auto Extensometer

• SIE-560S

This extensometer uses a high-precision strain-gauge sensor and magnetic induction sensor to automatically set the gauge marker positions. The extensometer can be automatically attached/removed.

When used with bending test jigs, the following adaptor is required.
346-55658-XX

• Differential Transformer Type Extensometers DT Series

Applicable to the elongation measurement of metal.
Maximum diameter, thickness 45 mm
Compliant with Strain Rate Control Test Methods ISO 6892

• Soft material extensometer DSES -1000

Easily and accurately measures large elongation amounts. 1000 mm Maximum Movement Distance, ±0.2% Relative Elongation Measurement Precision.

When used with bending test jigs, the following adaptor is required 346-53679-01

• Strain gauge type width sensor

Measures changes in specimen width.

Various test jigs

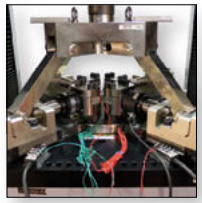
• Axial alignment unit PAS

For testing CFRP and GFRP materials, the axial center of the testing machine must be aligned. In addition, to meet the NADCAP requirements, ASTM E1012 also requires axial alignment. Attaching this unit to the testing machine allows the axial center to be aligned.

Capacity	P/N
50 kN	346-57158-01
100 kN	346-57158
250kN/300 kN	346-57158-02

• Biaxial test device NEW

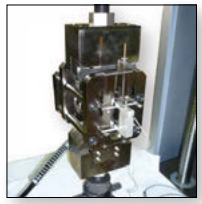
Attaching this device to an Autograph tester enables testing with tensile ratios of 1:1, 1:1.5, and 1:2 using the compressive force of the tester. This allows biaxial tests in conformance with ISO 16842, enabling acquisition of data for plastic working simulations.



Capacity	P/N	Maximum biaxial test force
For 100 kN tester	346-58348-02	20kN
For 250 kN/300 kN tester	346-58348-01	50kN

• Bauschinger effect measurement jig

This jig is used for in-plane compression tests of flat plates. It enables measurements of the Bauschinger effect, which are required in plastic working simulations.



Test force capacity	Anti-wrinkle pressure	Applicable sample	Jig movement range
±50 kN	20 kN max. (hydraulic control)	For JIS No. 13 sample Total length: 200 mm, thickness: 0.8 to 2 mm	22 mm (±11 mm)

• ASTM ASTM D7078 / D7078M

V-notched rail shear test evaluations for composite materials

In this test, both ends of a sample with a vertical 90-degree V-notch are gripped, and a shearing force is applied. With ASTM D5379, a load is applied to the vertical endpoints. With D7078 however, gripping the surface enables a higher shearing load to be loaded. Larger samples can be tested than with D5379.

Controlled atmosphere test device

• Thermostatic chamber TCE series

This compact chamber enables testing across a wide temperature range of -70°C to +280°C.
+125 mm and +250 mm extension types have been added.

• Thermostatic chamber TCL Series

This chamber allows the temperature to be controlled within the following ranges.
-180 to 320 °C (TCL-N)
-70 to 320 °C (TCL-C)

• Bellows-type long stroke thermostatic chamber

Bellows design is well-suited to testing of highly elastic materials.

Specifications

[Table-Top Type AG-X plus]

1. Model Name			AG-Xplus	AG-Xplus HS	AG-Xplus SC	AG-XDplus
2. Max. Load Capacity			10 kN	5 kN	10 kN	20 kN / 50 kN
3. Loading Method			Direct, high-precision, constant-rate strain control using non-backlash precision ball-screw drive			
4. Test Force Measurement	Precision	High-precision unit 1/1000	Within ± 0.5% of displayed test force (for 1/100 to 1/1000 of load cell rated capacity) Within ± 0.3% of displayed test force (for 1/1 to 1/100 of load cell rated capacity) Conforms to JIS B7721 Class 0.5, EN 10002-2 Grade 0.5, ISO 7500-1 Class 0.5, BS1610 Class 0.5, DIN51221 Class 1, and ASTM E4*3			
		Standard-precision unit 1/1000	Within ± 1% of displayed test force (for 1/1 to 1/1000 of the load cell rated capacity) Conforms to JIS B7721 Class 1, EN 10002-2 Grade 1, ISO 7500-1 Class 1, BS1610 Class 1, DIN51221 Class 1, and ASTM E4*3			
		Standard-precision unit 1/500	Within ± 1% of displayed test force (for 1/1 to 1/500 of load cell rated capacity) Conforms to JIS B7721 Class 1, EN 10002-2 Grade 1, ISO 7500-1 Class 1, BS1610 Class 1, DIN51221 Class 1, and ASTM E4*3			
	Test force calibration		Automatic calibration Standard-precision type: Tensile and compression forces calibration High-precision type : Choose from calibration of tensile force, compression force, or both tensile and compression forces			
5. Crosshead Speed Range (mm/min)			Free step-less setting			
			0.0005 to 1500 mm/min	0.001 to 3000 mm/min	0.0005 to 1500 mm/min	0.0005 to 1000 mm/min
	Maximum Return Speed		1650 mm/min	3300 mm/min	1650 mm/min	1200 mm/min
6. Crosshead Speed Precision*1			±0.1%			
7. Crosshead Speed and Allowed Test Force			Maximum load capacity for all speeds			
8. Crosshead-Table Clearance (mm) (Tensile stroke) *2			<Standard height> Max. 1150 mm (MWG 600 mm)	<Standard height> Max. 1150 mm (MWG 600 mm)	Max. 700 mm (MWG 150 mm)	<Standard height> Max. 1060 mm (MWG 665 mm) : 20 kN (MWG 515 mm) : 50 kN
			<+250 mm column extension> Max. 1370 mm (MWG 820 mm)	<+250 mm column extension> Max. 1370 mm (MWG 820 mm)		<+250 mm column extension> Max. 1280 mm (MWG 875 mm) : 20 kN (MWG 735 mm) : 50 kN
			<+500 mm column extension> Max. 1590 mm (MWG 1040 mm)	<+500 mm column extension> Max. 1590 mm (MWG 1040 mm)		<+500 mm column extension> Max. 1500 mm (MWG 1095 mm) : 20 kN (MWG 955 mm) : 50 kN
			<+750 mm column extension> Max. 1810 mm (MWG 1260 mm)	<+750 mm column extension> Max. 1810 mm (MWG 1260 mm)		
9. Effective Test Width (mm)			420 mm			500 mm
10. Crosshead Position Detection	Measurement and display methods		Optical encoder measurement, digital display			
	Precision		Within ±0.1% of indicated value, however, ±0.01 mm when indicated value is below 10 mm			
11. Data Capture Rate			5000 Hz			
12. Data Sampling Rate			300 kHz			
13. Frame Rigidity (kN/mm)			42 kN/mm			120 kN/mm
14. Standard Functions			• Lineup of Models Differing by Load Cell Capacity • Automatic reading of load cell properties • Fine adjustment of crosshead position • Test force and stroke display • External analog output (2 channels) • External analog input (2 channels) • External digital input (2 channels) • Internal amps - 4 ports (one is used for test force and another for analog input) • USB interface (for PC) / Host interface (for USB memory) • Recorder output (optional) • Dataletty output (optional) *4 *5 • Pneumatic grip interlock operation (optional)		• Automatic test force and strain control (with auto tuning) • Test force auto zero / auto calibration • Break detection / auto return • Crosshead speed free setting / cycle count display • Stress value display / extensometer value display • Soft limit detection / self diagnostics If only optional LCD touch panel is used: • Single testing control / Cycle testing control / Control of testing conforming to standards • PEAK and BREAK values display / Crosshead speed pre-setting • Method internal memory file (20 files) • Japanese/English switchover / S-S curve display	
15. Standard Accessories			1 load cell, 1 CAL cable, tool set, and instruction manuals			
16. Lineup of Models Differing by Load Cell Capacity*6			10 N / 20 N / 50 N 100 N / 500 N / 1 kN 2 kN / 5 kN / 10 kN	50 N / 100 N / 500 N 1 kN / 2 kN / 5 kN	10 N / 20 N / 50 N 100 N / 500 N / 1 kN 2 kN / 5 kN / 10 kN	20 kN / 50 kN
17. Dimensions (approx.) W × D × H (mm)	Main frame		<Standard height*7> 777 × 510 × 1580	<Standard height*7> 777 × 510 × 1580	777 × 510 × 1130	<Standard height> 995 × 579 × 1606
			<+250 mm column extension*7> 777 × 510 × 1830	<+250 mm column extension*7> 777 × 510 × 1830		<+250 mm column extension> 995 × 579 × 1856
			<+500 mm column extension*7> 777 × 510 × 2080	<+500 mm column extension*7> 777 × 510 × 2080		<+500 mm column extension> 995 × 579 × 2106
			<+750 mm column extension*7> 777 × 510 × 2330	<+750 mm column extension*7> 777 × 510 × 2330		
	Measurement controller		Housed in main frame			
	Smart Controller		80 × 50 × 250 (attached on right side of main unit - detachable)			

*1: Crosshead speed precision is calculated using crosshead transfer amount within a specified period of time for the crosshead speed of 0.5 mm/min to 500 mm/min under normal conditions.

*2: Tensile stroke is the value used when attaching the MWG (non-shift wedge type) grips.
Stroke can be extended. Values under 5 kN are with SCG (screw type flat) grips attached.

*3: JIS B7721, EN 10002-2, ISO 7500-1, and ASTM E4 standards recommend re-verification after installation of testing machine.

*4: The LCD touch panel (optional) is required for Dataletty (optional).

*5: Dateletty (optional) and TRAPEZIUM X operational software cannot be used together.

*6: 10 N and 20 N are only available to the standard-precision unit.

*7: Reinforced yoke is 50 mm high more than other units.

Note: Values in this catalog have been measured based on separately-approved test standards.

Note: If fine conductive fragments are produced, they may enter into the unit, resulting in malfunctions. Consult your Shimadzu representative separately in such cases.

Standard/Table-top Model (Up to 10 kN)

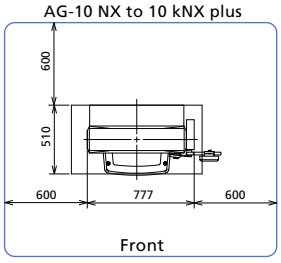
Table-top Model (20 kN)

- The LCD touch panel, laptop PC, and table are optional.
- Table used in image (for up to 10 kN table-top model) is not a Shimadzu product.

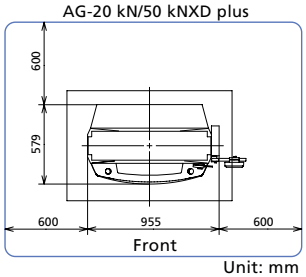
Installation Space

(Dimensions given for left, right, and back of the main unit are the space required for maintenance.)

AG-10 NX to 10 kNX plus



AG-20 kN/50 kNXD plus



Unit: mm

Model	Mass (approx. kg)				Power Requirement (Figures in parentheses are power consumption.)	Installation Environment
	Standard height	+250 mm column extension	+500 mm column extension	+750 mm column extension		
AG-10 N to 10 kNXplus	153	163	173	183	Single phase 100 to 110/115 to 130/ 220 to 230/240V (switching system) 50 to 60 Hz 1.5 kVA (450 W)	Temp.: 5 to 40°C Humidity: 20 to 80% (no condensation) Voltage fluctuation: ±10% max. Vibration: Frequency 10 Hz max. Amplitude: 5 µm max.
AG-20 kN/ 50 kNXDplus	261	274	287	—	Single phase 200 to 230 V 50 to 60 Hz 5 kVA (1.2 kW)	

(Note) With the AG-X plus reinforced yoke models with a capacity of 10 N to 10 kN, the weight is increased by approximately 30 kg more than noted above.
With the AG-20kN/50kNXDplus reinforced yoke models, the weight is increased by approximately 80 kg more than noted above. Grounding of 100 W or less is required.

LCD Touch Panel Unit (table-top model)

Load cell one-touch attachment unit (for 10 kN or less table-top models)

The Load cell one-touch attachment unit includes a load cell attachment. One load cell attachment is required for each load cell attached.

Load cell quick attach/release unit (for table-top models with a capacity of 10 kN max.)

One load cell attachment is provided with the load cell quick attach/release unit.

A load cell attachment is required for each additional load cell.

Specifications

[Floor Type AG-X plus]

1. Model Name		Floor Type		
		AG-20 kN / 50 kNXplus	AG-100 kNXplus	AG-250 kN / 300 kNXplus
2. Max. Load Capacity		20 kN / 50 kN	100 kN	250 kN / 300 kN
3. Loading Method		Direct, high-precision, constant-rate strain control using non-backlash precision ball-screw drive		
4. Test Force Measurement	Precision: High-precision unit 1/1000 (1/250 for 250 kN and 300 kN models)	Within ± 0.5% of displayed test force (for 1/100 to 1/1000 of load cell rated capacity) Within ± 0.3% of displayed test force (for 1/1 to 1/100 of load cell rated capacity)		Within ±0.5% of displayed test force (for 1/1 to 1/250 of load cell rated capacity)
		Conforms to JIS B7721 Class 0.5, EN 10002-2 Grade 0.5, ISO 7500-1 Class 0.5, BS1610 Class 0.5, DIN51221 Class 1, and ASTM E4*3		
	Standard-precision unit 1/1000	Within ± 1% of displayed test force (for 1/1 to 1/1000 of load cell rated capacity) Conforms to JIS B7721 Class 1, JIS B7733 Class 1, EN 10002-2 Grade 1, ISO 7500-1 Class 1, BS1610 Class 1, DIN51221 Class 1, and ASTM E4*4		
	1/500	Within ± 1% of displayed test force (for 1/1 to 1/500 of the load cell rated capacity) Conforms to JIS B7721 Class 1, EN 10002-2 Grade 1, ISO 7500-1 Class 1, BS1610 Class 1, DIN51221 Class 1, and ASTM E4*3		
	Test force calibration	Automatic calibration — Standard-precision type: Tensile and compression forces calibration High-precision type : Choose from calibration of tensile force, compression force, or both tensile and compression forces		
5. Crosshead Speed Range (mm/min)		Free step-less setting		
		0.0005 to 1000 mm/min		0.0005 to 500 mm/min
	Maximum Return Speed	1200 mm/min		600 mm/min
6. Crosshead Speed Precision*1		±0.1%		
7. Crosshead Speed and Allowed Test Force		Maximum load capacity for all speeds		0.0005 ~ 250 mm/min : 300 kN 250 ~ 500 mm/min : 250 kN
8. Crosshead-Table Clearance (mm) (Tensile stroke) *2		<Standard height> Max. 1265 mm (850 mm): 20 kN (800 mm): 50 kN	<Standard height> Max. 1250 mm (650 mm)	<Standard height> Max. 1440 mm (600 mm)
		<+250 mm column extension> Max. 1485 mm (1070 mm): 20 kN (1020 mm): 50 kN	<+250 mm column extension> Max. 1480 mm (875 mm)	<+250 mm column extension> Max. 1690 mm (850 mm)
		<+500 mm column extension> Max. 1705 mm (1290 mm): 20 kN (1240 mm): 50 kN	<+500 mm column extension> Max. 1705 mm (1105 mm)	<+500 mm column extension> Max. 1930 mm (1090 mm)
		<+750 mm column extension> Max. 1925 mm (1510 mm): 20 kN (1460 mm): 50 kN	<+750 mm column extension> Max. 1940 mm (1345 mm)	<+750 mm column extension> Max. 2165 mm (1325 mm)
9. Effective Test Width (mm)		600 mm		
10. Crosshead Position Detection	Measurement and display methods	Optical encoder measurement, digital display		
	Precision	Within ±0.1% of indicated value, but ±0.01 mm when the indicated value is below 10 mm		
11. Data Capture Rate		5000 Hz		
12. Data Sampling Rate		300 kHz		
13. Frame Rigidity (kN/mm)		Min. 175 kN/mm	Min. 300 kN/mm	Min. 400 kN/mm
14. Standard Functions		• Power savings functionality during standby • Automatic reading of load cell properties • Fine adjustment of crosshead position • Test force and stroke display • External analog output (2 channels) • External analog input (2 channels) • External digital input (2 channels) • Internal amps - 4 ports (one is used for test force and another for analog input) • USB interface (for PC) / Host interface (for USB memory) • Recorder output (optional) • Dataletty output (optional) *4 *5 • Pneumatic grip interlock operation (optional)		• Automatic test force and strain control (with auto tuning) • Test force auto zero / auto calibration • Break detection / auto return • Crosshead speed free setting / cycle count display • Stress value display / extensometer value display • Soft limit detection / self diagnostics If only optional LCD touch panel is used: • Single testing control / Cycle testing control / Control of testing conforming to standards • PEAK and BREAK values display / Crosshead speed pre-setting • Method internal memory file (20 files) • Japanese/English switchover / S-S curve display
15. Standard Accessories		1 load cell, 1 CAL cable, tool set, and instruction manuals		
16. Lineup of Models Differing by Load Cell Capacity		20 kN/50 kNX	100 kNX	250 kN/300 kN
17. Dimensions (approx.) W × D × H (mm)	Main frame	<Standard height*6> 1186 × 752 × 2164		<Standard height*6> 1186 × 752 × 2414
		<+250 mm column extension*6> 1186 × 752 × 2414		<+250 mm column extension*6> 1186 × 752 × 2664
		<+500 mm column extension*6> 1186 × 752 × 2664		<+500 mm column extension*6> 1186 × 752 × 2914
		<+750 mm column extension*6> 1186 × 752 × 2914		<+750 mm column extension*6> 1186 × 752 × 3164
	Measurement controller	Housed in main frame		
	Smart Controller	80 × 50 × 250 mm (attached on right side of main unit - detachable)		

*1: Crosshead speed precision is calculated using crosshead transfer amount within a specified period of time for the crosshead speed of 0.5 mm/min to 500 mm/min under normal conditions.

*2: Tensile stroke is the value used when attaching the MWG (non-shift wedge type) grips.

*3: JIS B7721, EN 10002-2, ISO 7500-1, and ASTM E4 standards recommend re-verification after installation of testing machine.

*4: The LCD touch panel (optional) is required for Dataletty (optional).

*5: Dateletty (optional) and TRAPEZIUM X operational software cannot be used together.

*6: Reinforced yoke is 50 mm high more than other units.

* Values in this catalog have been measured based on separately-approved test standards.

Floor Model (20 kN/50 kN/100 kN)

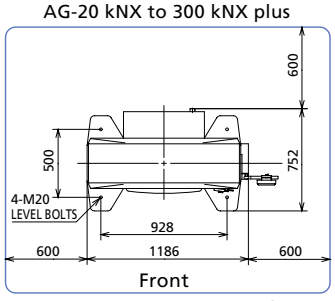
Floor Model (250 kN/300 kN)

- Laptop PC and table are optional.
- The LCD touch panel, laptop PC, and table are optional.

Installation Space

(Dimensions given for left, right, and back of the main unit are the space required for maintenance.)

AG-20 kNX to 300 kNX plus



Unit: mm

Model	Mass (approx. kg)	Power requirement - consumed power is in ( )	Installation Environment
AG-20 kN / 50 kNXplus	654	Three phase 200 to 230 V 50 to 60 Hz 5 kVA (1.2 kW)	Temp.: 5°C to 40°C Humidity: 20% to 80% (no condensation) Voltage fluctuation: ±10% max. Vibration: Frequency 10 Hz max. Amplitude 5 µm max.
AG-100 kNXplus	834	Three phase 200 to 230 V 50 to 60 Hz 7 kVA (2.0 kW)	
AG-250 kN / 300 kNXplus	960	Three phase 200 to 230 V 50 to 60 Hz 7.5 kVA (2.5 kW)	

(Note) With the AG-20 kN/50 kNXplus reinforced yoke models, the weight is increased by approximately 130 kg more than noted above.
With the AG-100 kNXplus reinforced yoke models, the weight is increased by approximately 150 kg more than noted above.
With the AG-250 kN/300 kNXplus, for proof strength yoke models, the weight is increased by approximately 250 kg more than noted above.
Grounding of 100 W or less is required.

Extensions to the Main Unit [Table-Top Models and Floor Models]

• Ultralow-speed crosshead model

The crosshead speed range can be widened to include extremely low speeds.

	Ultralow-speed models
Speed Range (mm/min)	0.00005 mm/min to 1000 mm/min (250 kN and 300 kN models are limited to 500 mm/min.)

Specifications

[Wide-Type AG-X plus]

1. Model Name	Table-top type	Floor type		
	AG-XPlus (Up to 10 kN)	AG-20/50 kNPlus W975	AG-20/50 kNPlus W1100	AG-20/50 kNPlus W1375
2. Max. Load Capacity	10 kN	20 kN/50 kN		
3. Effective Test Width	1000 mm	975 mm	1100 mm	1375 mm
4. Crosshead-Table Clearance (Tensile stroke)*1	<Standard height> Max. 1120 mm (570 mm)	<Standard height> Max. 1145 mm (730 mm): 20 kN (680 mm): 50 kN	<Standard height> Max. 1095 mm (680 mm): 20 kN (630 mm): 50 kN	
	<+250 mm column extension> Max. 1370 mm (790 mm)	<+250 mm column extension> Max. 1365 mm (950 mm): 20 kN (900 mm): 50 kN	<+250 mm column extension> Max. 1315 mm (900 mm): 20 kN (850 mm): 50 kN	
	<+500 mm column extension> Max. 1560 mm (1010 mm)	<+500 mm column extension> Max. 1585 mm (1170 mm): 20 kN (1120 mm): 50 kN	<+500 mm column extension> Max. 1535 mm (1120 mm): 20 kN (1070 mm): 50 kN	
	<+750 mm column extension> Max. 1780 mm (1230 mm)	<+750 mm column extension> Max. 1805 mm (1390 mm): 20 kN (1340 mm): 50 kN	<+750 mm column extension> Max. 1755 mm (1340 mm): 20 kN (1290 mm): 50 kN	
5. Main Frame Dimensions (approx.) W × D × H	<Standard height> 1357 × 510 × 1580	<Standard height> 1566 × 752 × 2164	<Standard height> 1691 × 752 × 2164	<Standard height> 1966 × 752 × 2164
	<+250 mm column extension> 1357 × 510 × 1830	<+250 mm column extension> 1566 × 752 × 2414	<+250 mm column extension> 1691 × 752 × 2414	<+250 mm column extension> 1966 × 752 × 2414
	<+500 mm column extension> 1357 × 510 × 2080	<+500 mm column extension> 1566 × 752 × 2664	<+500 mm column extension> 1691 × 752 × 2664	<+500 mm column extension> 966 × 752 × 2664
	<+750 mm column extension> 1357 × 510 × 2330	<+750 mm column extension> 1566 × 752 × 2914	<+750 mm column extension> 1691 × 752 × 2914	<+750 mm column extension> 1966 × 752 × 2914

1. Model Name	Floor type					
	AG-100 kNX W975	AG-100 kNX W1100	AG-100 kNX W1375	AG-250/300 kNPlus W975	AG-250/300 kNPlus W1100	AG-250/300 kNPlus W1375
2. Max. Load Capacity	100 kN			250 kN/300 kN		
3. Effective Test Width	975 mm	1100 mm	1375 mm	975 mm	1100 mm	1375 mm
4. Crosshead-Table Clearance (Tensile stroke)*1	<Standard height> Max. 1115 mm (515 mm)	<Standard height> Max. 1055 mm (455 mm)		<Standard height> Max. 1295 mm (455 mm)	<Standard height> Max. 1230 mm (390 mm)	
	<+250 mm column extension> Max. 1335 mm (735 mm)	<+250 mm column extension> Max. 1275 mm (675 mm)		<+250 mm column extension> Max. 1545 mm (705 mm)	<+250 mm column extension> Max. 1480 mm (640 mm)	
	<+500 mm column extension> Max. 1555 mm (955 mm)	<+500 mm column extension> Max. 1495 mm (895 mm)		<+500 mm column extension> Max. 1785 mm (945 mm)	<+500 mm column extension> Max. 1720 mm (880 mm)	
	<+750 mm column extension> Max. 1775 mm (1175 mm)	<+750 mm column extension> Max. 1715 mm (1115 mm)		<+750 mm column extension> Max. 2020 mm (1180 mm)	<+750 mm column extension> Max. 1955 mm (1115 mm)	
5. Main Frame Dimensions (approx.) W × D × H	<Standard height> 1566 × 752 × 2164	<Standard height> 1691 × 752 × 2164	<Standard height> 1966 × 752 × 2164	<Standard height> 1566 × 752 × 2414	<Standard height> 1691 × 752 × 2414	<Standard height> 1966 × 752 × 2414
	<+250 mm column extension> 1566 × 752 × 2414	<+250 mm column extension> 1691 × 752 × 2414	<+250 mm column extension> 1966 × 752 × 2414	<+250 mm column extension> 1566 × 752 × 2664	<+250 mm column extension> 1691 × 752 × 2664	<+250 mm column extension> 1966 × 752 × 2664
	<+500 mm column extension> 1566 × 752 × 2664	<+500 mm column extension> 1691 × 752 × 2664	<+500 mm column extension> 1966 × 752 × 2664	<+500 mm column extension> 1566 × 752 × 2914	<+500 mm column extension> 1691 × 752 × 2914	<+500 mm column extension> 1966 × 752 × 2914
	<+750 mm column extension> 1566 × 752 × 2914	<+750 mm column extension> 1691 × 752 × 2914	<+750 mm column extension> 1966 × 752 × 2914	<+750 mm column extension> 1566 × 752 × 3164	<+750 mm column extension> 1691 × 752 × 3164	<+750 mm column extension> 1966 × 752 × 3164

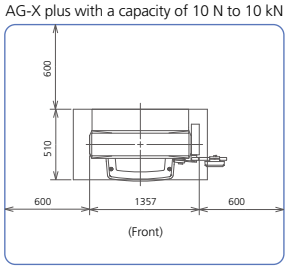
*1 Tensile stroke is the value used when attaching the MWG (non-shift wedge type) grips.
Note: Items not specified in the table above are as per the standard specifications, with the exception of frame rigidity.
Note: Power consumption is the same as that of the standard units. Refer to the specifications for the standard units.

Note: Values in this catalog have been measured based on separately approved test standards.
Note: If fine conductive fragments are produced, they may enter into the unit, resulting in malfunctions. Consult your Shimadzu representative separately in such cases.

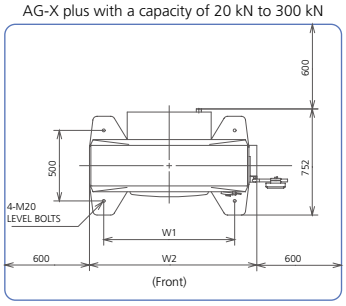
Installation Space

(Dimensions given for left, right, and back of the main unit are required for maintenance.)

AG-X plus with a capacity of 10 N to 10 kN



AG-X plus with a capacity of 20 kN to 300 kN



Unit: mm

Tester	W1	W2
AG-20/50/100/250/300 kNXPlus W975	1308	1566
AG-20/50/100/250/300 kNXPlus W1100	1433	1833
AG-20/50/100/250kN/300 kNXPlus W1375	1708	1966

Specifications

[High-Speed Type AG-X plus]

1. Model Name			Table-top type	Floor type		
			AG-1 kN	AG-1 kN	AG-10 kN	AG-10 kN
2. Max. Load Capacity			1 kN	1 kN	10 kN	10 kN
3. Test Force Measurement	Precision	High-precision unit 1/1000	Within ±0.5% of displayed test force (For 1/100 to 1/1000 of load cell rated capacity) Within ±0.3% of displayed test force (For 1/1 to 1/100 of load cell rated capacity) Conforms to JIS B7721 Class 0.5, EN 10002-2 Grade 0.5, ISO 7500-1 Class 0.5, BS1610 Class 0.5, and ASTM E4. *2			
		Standard precision unit 1/1000	Within ±1% of displayed test force (For 1/100 to 1/1000 of load cell rated capacity) Conforms to JIS B7721 Class 1, EN 10002-2 Grade 1, ISO 7500-1 Class 1, BS1610 Class 1, and ASTM E4. *2			
		1/500	Within ±1% of displayed test force (For 1/100 to 1/500 of load cell rated capacity) Conforms to JIS B7721 Class 1, EN 10002-2 Grade 1, ISO 7500-1 Class 1, BS1610 Class 1, and ASTM E4. *2			
4. Crosshead Speed Range*1			0.002 to 6000 mm/min	0.006 to 12000 mm/min	0.003 to 6000 mm/min	0.012 to 12000 mm/min
	Maximum return speed		6600 mm/min	13200 mm/min	6600 mm/min	13200 mm/min
5. Crosshead Speed and Allowed Test Force			Maximum load capacity for all speeds			
6. Crosshead-Table Clearance			Max. 1150 mm	Max. 1250 mm	Max. 1250 mm	Max. 1440 mm
7. Effective Test Width			420 mm	600 mm	600 mm	600 mm
8. Dimensions (approx.) W × D × H	Main frame		777 × 510 × 1130 mm	1186 × 752 × 2164 mm	1186 × 752 × 2164 mm	1186 × 752 × 2414 mm
	Measurement controller		Housed in main frame			
	Smart controller		80 × 50 × 250 mm Attached on right side of main unit - detachable			
9. Power Supply			Single-phase 100 V 50-60 Hz 1.5 kVA(450W)	Three-phase 200 V 50-60 Hz 7 kVA(2.0 kW)	Three-phase 200 V 50-60 Hz 7 kVA(2.0 kW)	Three-phase 200 V 50-60 Hz 7.5 kVA(2.5 kW)
10. P/N			346-56990-01	346-56991-01	346-56992-01	346-56993-01

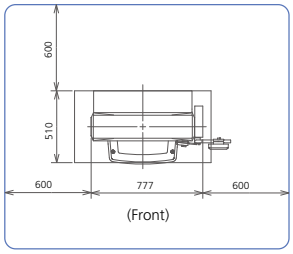
*1 Crosshead speed precision is calculated using crosshead transfer amount within a specified period of time for the crosshead speed of 0.5 mm/min to 500 mm/min under normal conditions.
*2 JIS B7721, EN 10002-2, ISO 7500-1, and ASTM E4 standards recommend re-verification after installation of testing machine.
Note: Items not specified in the table above are as per the specifications of the floor type AG-X plus, with the exception of frame rigidity.

Note: If fine conductive fragments are produced, they may enter into the unit, resulting in malfunctions. Consult your Shimadzu representative separately in such cases.

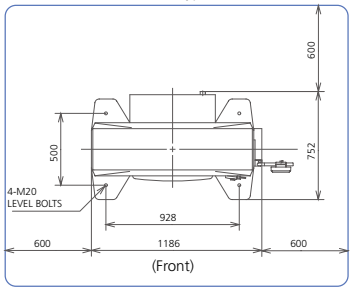
Installation Space

(Dimensions given for left, right, and back of the main unit are required for maintenance.)

Table-top type



Floor type



Unit: mm

Load cell capacity	Effective test width	Universal joint (P/N)	Tension-compression load jig
20N/50N	Standard/ 1000	343-30569	346-51531-02
100N/500N/1 kN/5 kN	Standard/ 1000	343-07104-01 (without detent) 343-07104-03 (with detent)	346-51531-02
10 kN	Standard/ 1000	344-11103-04	346-51531-01
20 kN(SPL)	Standard	344-11103-04	346-51531-01
20 kN(SFL)	Standard	344-11103-07	346-51530-01
	975	344-11103-31	346-51530-71
	1100	344-11103-32	346-51530-81
	1375	344-11103-32	346-51530-81
50 kN	Standard	344-11102-04	346-51530-02
	975	344-11102-31	346-51530-72
	1100	344-11102-32	346-51530-82
	1375	344-11102-32	346-51530-82
100 kN	Standard	344-11101-04	346-51530-63
	975	344-11101-31	346-51530-73
	1100	344-11101-32	346-51530-83
	1375	344-11101-32	346-51530-83
250 kN	Standard	344-11104-01	346-51530-64
	975	344-11104-21	346-51530-74
	1100	344-11104-22	346-51530-84
	1375	344-11104-22	346-51530-84
300 kN	Standard	344-11104-31	346-51530-65
	975	344-11104-33	346-51530-75
	1100	344-11104-34	346-51530-85
	1375	344-11104-34	346-51530-85

Specifications

[Large-Capacity Floor Type AG-X plus]

1. Model Name		Floor type			
		AG-500/600kN	AG-1000kN	AG-1500kN	AG-2000kN
2. Load Capacity		500kN/600kN	1000kN	1500kN	2000kN
3. Loading Method		Direct, high-precision, constant-rate strain control using non-backlash precision ball-screw drive			
4. Test Force Measurement	Test Force Calibration	Within ±1% of displayed test force (For 1/1 to 1/250 of load cell rated capacity) Conforms to JIS B7721 Class 1, EN 10002-2 Grade 1, ISO 7500-1 Class 1, BS1610 Class 1, and ASTM E4. *2			
5. Crosshead Speed Range		0.001 to 250 mm/min	0.001 to 250 mm/min	0.001 to 250 mm/min	0.05 to 100 mm/min
	Maximum return speed	500 mm/min	250 mm/min	250 mm/min	100 mm/min
6. Crosshead Speed Precision*1		±0.1%			
7. Crosshead Speed and Allowed Test Force		0.001 to 250 mm/min: 500 kN/600 kN	0.001 to 50 mm/min: 1000kN 50 to 250 mm/min: 100 kN	0.001 to 25 mm/min: 1500kN 25 to 250 mm/min: 100 kN	0.05 to 100 mm/min: 2000 kN
8. Crosshead-Table Clearance (Tensile stroke)		1600	1550	2450	1643(min) to 3350(MAX)
9. Effective Test Width		750 mm	750 mm	900 mm	1200 mm
10. Crosshead Position Detection	Measurement and display methods	Measurement with optical encoder; digital display			
	Precision	Within ±0.1% of indicated value, however, ±0.01 mm when indicated value is below 10 mm			
11. Data Capture Rate		5000 Hz			
12. Data Sampling Rate		300 kHz			
13. Standard Functions		• Power savings functionality during standby • Automatic reading of load cell properties • Fine adjustment of crosshead position • Test force and stroke display • External analog output (2 channels) • External analog input (2 channels) • External digital input (2 channels) • Internal amps - 4 ports (One is used for test force and another for analog input.) • USB interface (for PC) / Host interface (for USB flash drive) • Recorder output (optional) • Dataletty output (optional)*3, *4 • Pneumatic grip interlock operation (optional) • Automatic test force and strain control (with autotuning)		• Test force auto zeroing • Test force auto calibration • Break detection • auto return • Crosshead speed free setting • cycle count display • Stress value display • extensometer value display • Soft limit detection • self diagnostics If only optional LCD touch panel is used: • Single testing control • Cycle testing control • Control of testing conforming to standards • PEAK and BREAK values display • Crosshead speed pre-setting • Method internal memory file (20 files) • Japanese/English switchover • S-S curve display	
14. Accessories	Load cell	For 500/600 kN	For 1000 kN	For 1500 kN	For 2000 kN
	CAL cable				
	Other	Standard tool set, instruction manual, and limit caution plate			
15. Dimensions (approx.) W × D × H	Main frame	1550 × 1000 × 3000 mm	1900 × 1380 × 3300 mm Foundation work is required at the installation site.	2050 × 1600 × 4550 mm Foundation work is required at the installation site.	2300 × 2000 × 6102 mm Foundation work is required at the installation site.
	Measurement controller	Installed separately, 250 × 450 × 600 mm	Installed separately, 515 × 600 × 850 mm	Installed separately, 515 × 600 × 1750 mm	
	Smart controller	80 × 50 × 250 mmm Attached on right side of main unit - detachable			

*1 Crosshead speed precision is calculated using crosshead transfer amount within a specified period of time for the crosshead speed of 0.5 mm/min to 250 mm/min under normal conditions.
*2 JIS B7721, EN 10002-2, ISO 7500-1, and ASTM E4 standards recommend re-verification after installation of testing machine.
*3 The LCD touch panel (optional) is required for Dataletty (optional).
*4 Dateletty (optional) and TRAPEZIUM X operational software cannot be used together.
Note: 600 mm of maintenance space is required behind the testing machine.

Note: Values in this catalog have been measured based on separately approved test standards.
Note: If fine conductive fragments are produced, they may enter into the unit, resulting in malfunctions. Consult your Shimadzu representative separately in such cases.

Model	Weight (approx., kg)	Power requirement - consumed power is in ( )	Installation environment
AG-500/600kN	2650	Three-phase 200 V 50-60 Hz 10 kVA	Temp.: 5 to 40 °C Humidity: 20 to 80 % (no condensation) Voltage fluctuation: condensation: ±10 % max. Vibration: Frequency 10 Hz max. Amplitude 5 µm max.
AG-1000kN	7000	Three-phase 200 V 50-60 Hz 30 kVA	
AG-1500kN	10000	Three-phase 200 V 50-60 Hz 30 kVA	
AG-2000kN	16000	Three-phase 400 V 50-60 Hz 70 kVA	

(Note) Grounding of 100 W or less is required.

AG-600kNX

Specifications

[Special Floor Type AG-X plus]

Dual space testing system

System features

This system utilizes two spaces, above and below the crosshead, for testing. Therefore, it allows performing tests with two different types of jigs attached, which can significantly improve operating efficiency by eliminating the time and trouble required to switch between jigs. It can also be helpful if jigs are especially heavy or time-consuming to mount and adjust.

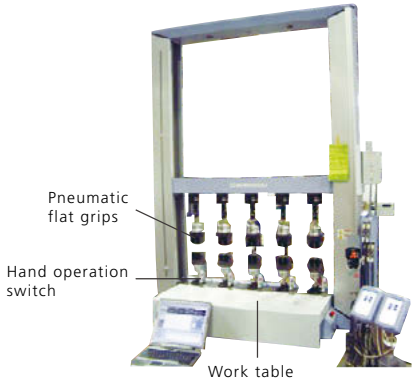
Main specifications

■ Loading unit
Upper space: Tensile testing
Lower space: Compression testing

5-sample tensile testing system

System features

This system is able to tensile-test up to five samples at the same time. This is especially helpful when performing a large number of tests, such as in quality control applications. By placing a work table in front of the testing machine, using pneumatic flat type grips with convenient hand operation switches, and so on, this system can significantly reduce the stress on operators.



Main specifications

■ Loading unit
Tensile test force: Max. 500 N each
Test force precision: 1% of indicated value within 2 to 500 N range
Test stroke: Max. 820 mm
Note: A 3-sample tensile test system can be also configured.

Torsion testing system

System features

This system is able to test various samples, such as metals, plastics, composites, and parts, by simultaneously applying tensile and torsional loads. Torsional loads are applied to test samples using an AC servo motor and tensile loads using a pulley and weights. Data is processed using specialized software, which enables setting angular velocity and other control settings, measuring torque and torque angle, and displaying graphs.

Main specifications

■ Loading unit
Test force
Torsion: Max. 250 N · m
Applicable samples: ø2 to 20 mm
Tension: Max. 100 N
Testing speed range: 0.001 to 40 rpm

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