

Product Information

multiXtens II HP Extensometer

CTA: 234936 208195



multiXtens II HP with two measurement carriages



multiXtens II HP

Applications

The multiXtens II HP extensometer is a highly versatile extensometer for changing applications and covers a large measuring range with high accuracy. It is ideally suited for tensile, compression, flexure, and cyclic tests on plastics, composites, elastomers, metals and composite materials.

The multiXtens II HP measures small and large specimen strains with high accuracy and features a measurement range up to 700 mm.

The extensometer automatically recognizes the installed sensor arm for the tensile, compression or flexure test.

multiXtens II HP is approved for closed loop strain rate control to ISO 6892-1 (2009) Method A (1) and to ASTM E8-09 Method B.

In addition, the extensometer meets the high requirements for determination of the tensile modulus and Poisson's ratio to ISO 527-1, Annex B and C.

A third measurement carriage (option) allows for adaptation of transverse strain and fine strain extensometers to the multiXtens II HP. This is important for determination of the Young's modulus or tensile modulus with two-sided strain measurement, as well as the determination of r - and n -values and Poisson's ratio.

The extensometer can be used for testing at ambient temperature and in temperature chambers.

Function description

Deformation of the specimen is recorded in the elastic and plastic deformation range throughout the entire tensile test until specimen break.

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Fully automatic extensometer

Extensive automated functions ensure optimum operating convenience and minimal operator influence. This also guarantees precise and reproducible measurement results.

The most important automated functions are:

- Self-identification of the measurement carriages and installed sensor arms
- Automatic test area measurement
- Automatic centering
- Automatic adjustment of the initial gauge length
- Automatic attachment and detachment of the sensor arms
- Monitoring of all safety distances
- Protection against incorrect operation

The displacement measuring system integrated in the measurement carriage is an absolute measurement system. This eliminates the need for a reference drive after the system has been switched on, providing additional operator safety and saving on setup time.

Interchangeable knife edges

The easily interchangeable, sensor-coded sensor arms are inserted in the mechanical measuring heads from the front. A change is also possible when the extensometer electronics are switched on. The sensor data is automatically read and transferred to the test program, providing additional operator safety and saving on setup time.

Advantages and features

- Maximum precision in the entire measurement range up to 700 mm and in temperature chambers.
- Accuracy class 0.5 to EN ISO 9513.
- multiXtens II HP is already calibrated from a measurement travel of 20 μm in Class 0.5. Maximum error $\pm 1 \mu\text{m}$ in the differential travel measurement between two measurement points in the range of 20 μm to 200 μm . This entirely fulfills the additional requirement stipulated by ISO 527-1 (2011).

- multiXtens II HP is approved for closed loop strain rate control to ISO 6892-1 (2009) Method A (1) and to ASTM E8-09 Method B.
- The fully automatic extensometer offers high operating comfort and minimizes operator influence through various automated functions.
- The sensor arms can be changed easily and without the need for tools. The sensor arms for tensile, compression and flexure tests are sensor coded. The extensometer electronics automatically recognize the installed sensor arm.
- Tiltable knife edges prevent damage to the sensor arms and knife edges at specimen break. Measurements up to specimen break can also be performed on specimens that are prone to whipping and brittle-fracturing specimens.
- Low drag force and the ability to adjust the contact force of the sensor arms as needed means you can test notched specimens and clamping-sensitive specimens reliably and with traceability.
- Sensor arms suitable for testing in temperature chambers are also available.
- A third measurement carriage (option) allows for adaptation of transverse strain and fine strain extensometers to the multiXtens II HP. This is important for determination of the Young's modulus or tensile modulus with two-sided strain measurement, as well as the determination of r - and n -values and Poisson's ratio.
- An EtherCAT interface is integrated into the electronics and the extensometer as standard, eliminating the need for an additional measurement module.
- The measured values are transferred from multiXtens HP II with the full testControl II measured value acquisition rate, providing a sufficient number of measured values even for quick tests with short test times.

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Technical data

multiXtens II HP for mounting to an AllroundLine testing system.

Direct connection via the test Control II EtherCAT interface. No additional modules or module slots are required.

Determination of the tensile modulus to ISO 527-1 is possible in combination with a sensor arm length of 300 mm or 450 mm and with all multiXtens versions.

Item No.	1078807 ¹⁾	1078808	
Basic unit	With 2 measurement carriages for connection of the sensor arms for extension measurement	With 3 measurement carriages for connection of the sensor arms for extension measurement and for connection of an extensometer for width/fine strain measurement	
3rd measurement carriage for connection of a fine strain or transverse strain extensometer	Retrofitting possible	Available	
Initial gauge length (dependent upon the sensor arms used)	5 / 10	5 / 10	mm
Measurement travel, max.	700 - L ₀	700 - L ₀	mm
Drag force	≤ 0.02	≤ 0.02	N
Resolution (dependent upon the sensor arms used)	0.004 ... 0.008		µm
Specimen dimensions			
Width, max.	60	60	mm
Flat specimen, thickness, max.	30	30	mm
Round specimen, Ø, max.	30	30	mm
Speeds			
Measurement speed, max.	500	500	mm/min
Return speed, max.	800	800	mm/min
Accuracy class to ISO 9513		Class 0.5 (1) ²⁾	
Dimensions, without measuring heads			
Height	1170	1170	mm
Width	220	275	mm
Depth	500	500	mm
Electrical connection			
Power supply	100 ... 240		V, 1Ph/N/PE
Power supply connection		100 ... 240	
Included Scope of delivery in the	Expanded remote control (for attachment of the sensor arms)		
Resolution(Dependent upon the sensor arms used)		0.004 ... 0.008	

1) Extension option, 3rd measurement carriage for multiXtens II HP, Item No.1078813.

2) Dependent upon the sensor arms used.

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Accessories required

Mounting variations

Mounting variations for table-top testing machines:

Description	Table-top testing machine with AR 440 mm	Table-top testing machine with AR 640 mm	multiXtens II HP
Fixed mounting set multiXtens II HP	Two test positions: 90° rear center with sensor arms 300 mm 45° rear left with sensor arms 450 mm	Test position: 90° rear center with sensor arms 300 mm 45° rear left with sensor arms 600 mm	1078828
Swivel mounting set multiXtens II HP (+TEE)	Two test positions: 90° rear center with sensor arms 300 mm 45° rear left with sensor arms 450 mm	-	1078852
Swivel mounting set multiXtens II HP (+TEE)	-	Two test positions: 90° rear center with sensor arms 300 mm 45° rear left with sensor arms 600 mm	1078830

Mounting variations for floor-standing testing machines:

Description	Floor-standing testing machine with AR 640 mm	Floor-standing testing machine with AR 1040 mm	multiXtens II HP
Fixed mounting set multiXtens II HP	Two test positions: 90° rear center with sensor arms 300 mm 45° rear left with sensor arms 600 mm	Two test positions: 90° rear center with sensor arms 300 mm 45° rear left with sensor arms 600 mm	1078829
Swivel mounting set multiXtens II HP (+TEE)	Two test positions: 90° rear center with sensor arms 300 mm 45° rear left with sensor arms 600 mm	Two test positions: 90° rear center with sensor arms 300 mm 45° rear left with sensor arms 600 mm	1078831

Sensor arms for tensile tests

Item No.	1078821 ¹⁾					
	1078818	1078819	1078820	2)	1094289	
Sensor arm length	300	450 ³⁾	600 ³⁾	300	600 ³⁾	mm
Initial gauge length, min.	10	10	10	5 ⁴⁾	10	mm
Opening width, max.	70	70	70	70	36	mm
Specimen grip separation, min.	26	26	26	26	26	mm

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Item No.	1078818	1078819	1078820	1078821 ¹⁾ 2)	1094289	
Specimen dimensions						
Round specimen						
Diameter, max.	30	30	30	30	30	mm
Flat specimen						
Width, max.	60	60	60	60	60	mm
Thickness, max.	30	30	30	30	30	mm
Resolution	0.004	0.006	0.008	0.004	0.04	µm
Accuracy to EN ISO 9513	Class 0.5	Class 0.5 from L ₀ 20 mm	Class 1 from L ₀ 20 mm	Class 0.5	Class 0.5 from L ₀ 20 mm	
Gripping force of the sensor arm	0.1 ... 3 (manually adjustable)	0.1 ... 3 (manually adjustable)	0.1 ... 3 (manually adjustable)	0.1 ... 3 (manually adjustable)	0.1 ... 3 (manually adjustable)	N
Ambient temperature	+10 ... +35	-70 ... +250	-70 ... +250	+ 10 ... + 35	-80 ... +360	°C
Scope of delivery	2	2	2	2	2	piece(s)

1) Initial gauge length ≥ 5 mm, Note: specimen grip to grip separation ≥ 25 mm required

2) Retrofitting can only be performed by an on-site service technician

3) Sensor arm length of 450 mm suitable for temperature chambers with a width of 400 mm, sensor arm length of 600 mm suitable for temperature chambers with a width of 600 mm (outer dimensions)

4) Max. measurement travel decreases by 5 mm

Forked sensor arms for compression tests

Two forked sensor arms are required for performing a compression test (minimum distance of compression plates > 13 mm).

Item No.	1078822	1078823	1078824	
Sensor arm length	300	450	600	mm
Resolution	0.004	0.006	0.008	µm
Accuracy to EN ISO 9513	Class 0.5	Class 1	Class 1	
Fork width	60	60	60	mm
Fork depth	105	105	105	mm
Specimen dimensions				
Width, max.	46	46	46	mm
Ambient temperature	+10 ... +35	-70 +250	-70 +250	°C
Scope of delivery	1	1	1	piece(s)

Sensor arms for 3-/4-point flexure tests

When mounting the flexure tool in the upper test area, two sensor arms are required for performing a flexure test with central deflection measurement; the lower test area requires one sensor arm.. Note: For the withdrawn standard DIN 53457 (4-point flexure test) for performing measurements using reference beams, a sensor arm as well as a corresponding forked sensor arm for compression tests is required (see above).

Item No.	1078825	1078826	1078827	
Sensor arm length	300	450	600	mm
Resolution	0.004	0.006	0.008	µm

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Item No.	1078825	1078826	1078827	
Accuracy to EN ISO 9513	Class 0.5	Class 1	Class 1	
Ambient temperature	+10 ... +35	-70 +250	-70 +250	°C
Scope of delivery	1	1	1	piece

Optional accessories

Knife edges for the sensors

The scope of delivery includes steel knife edges, each with a flat and a convex blade (rotating).

Application	Type	Knife edges	Ambient temperature [°C]	Item No.
Soft metal wires, round specimens	Interchangeable knife edges with corundum coating	straight/straight	-70 ... +80	310876
Clamping-sensitive specimens, elastomers, soft materials	Interchangeable knife edges with Vulkollan plate	Straight/straight	-15 ... +70	031216
Metal wires, clamping-sensitive plastics and wires	Interchangeable carbide knife edges	Straight/round, radius 0.5 mm	-70 ... +250	037646
Elastomers with high break energy	Interchangeable measuring insert with O-ring	Straight/straight	-30 ... +110	1009207
Metals	Interchangeable carbide knife edges	Straight/round, sharp-edged	-70 ... +250	1051659
Elastomers with high break energy and resilience	Interchangeable measuring insert with rollers	Specimen contact, pointed	-55 ... +180	1018413

Scope of delivery: 1 set = 4 pieces

videoXtens transverse strain extensometer

Description	ArticleNumber
videoXtens transverse strain extensometer only in conjunction with 300mm sensor arms and without temperature chamber ¹⁾	1043967

¹⁾ A free slot in testControl II is required for the INC module (included in delivery).

Accessories required for videoXtens transverse strain extensometer

videoXtens basic package (PC workstation incl. testXpert II / III and videoXtens software, 23" TFT monitor and operating instructions)

Description	ArticleNumber
Basic package with Windows 10 64-bit, multilingual	1031102

Mounting set for videoXtens transverse strain extensometer

Description	ArticleNumber
Mounting set for videoXtens transverse strain extensometer For attachment to multiXtens II HP ¹⁾	1078809

¹⁾ Only for 300 mm sensor arm length

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Mechanical transverse strain extensometer (absolute measurement)

The transverse strain extensometers are suitable for use in a temperature range of +10 ... + 35 °C. All transverse strain extensometers can only be used with the 300 mm sensor arms (1078818, 1078821). The transverse strain extensometers with 2 or 4 measuring lines are used for the determination of the r- and n-values.

The connection is made via the integrated EtherCat interface of the multiXtens II HP. If the 90° swivelable transverse strain extensometer is swiveled away, if it can reach a L_0 of ≥ 5 mm, or if attached to the specimen, the L_0 will increase to ≥ 50 mm!

Type	Item No.	Measuring lines	Resolution [μ m]	Measurement travel [mm]	Initial gauge length [mm]	Specimen width [mm]	Specimen thickness, max. [mm]	Contact forces [N]
Can be swiveled out by 90°, for varying specimen widths	1078814 ¹⁾	4	0.1	0 ... 6	$\geq 10/5^{2)}$	10 ... 25.4	4	0.5 ... 0.7
Can be swiveled out by 90°, for varying specimen widths	1078870 ¹⁾	4	0.01	0 ... 6	$\geq 10/5^{2)}$	10 ... 25.4	4	0.5 ... 0.7
Can be swiveled out by 90°, for varying specimen widths	1078871 ¹⁾	1	0.1	0 ... 6	$\geq 10/5^{2)}$	10 ... 25.4	4	0.5 ... 0.7
Can be swiveled out by 90°, for varying specimen widths	1084967 ¹⁾³⁾	1	0.01	0 ... 6	$\geq 10/5^{2)}$	10 ... 25.4	4	0.5 ... 0.7
Can be swiveled out by 90°, for varying specimen widths	1084968 ¹⁾	2	0.1	0 ... 6	$\geq 10/5^{2)}$	10 ... 25.4	4	0.5 ... 0.7
Can be swiveled out by 90°, for varying specimen widths	1084969 ¹⁾	2	0.01	0 ... 6	$\geq 10/5^{2)}$	10 ... 25.4	4	0.5 ... 0.7
Can be swiveled out by 15°, for varying specimen widths ⁴⁾	1084970	2	0.1	4 ... 9	$\geq 50^{2)}$	10 ... 15/20 ... 25.4	4	1.5 ... 2
Can be swiveled out by 15°, for varying specimen widths ⁴⁾	1084971	2	0.01	4 ... 9	$\geq 50^{2)}$	10 ... 15/20 ... 25.4	4	1.5 ... 2

1) Not in conjunction with fine strain extensometers (Item numbers 056895 and 058001)

2) Initial gauge length, see multiXtens II sensor arms

3) You can determine **Poisson's ratio** only with the transverse strain extensometer Item No. 1084967.

4) Through mechanical switching

The following applies to all devices: Accuracy class 1 to EN ISO 9513

Drive unit (strictly required for all transverse strain extensometers)

Description	ArticleNumber
Drive unit for transverse strain extensometer can be swiveled out by approx. 90° with 1 measuring line	1084972
Drive unit for transverse strain extensometer can be swiveled out by approx. 90° with 2 and 4 measuring lines.	1084973
Drive unit for transverse strain extensometer can be swiveled out by approx. 15°	1084974

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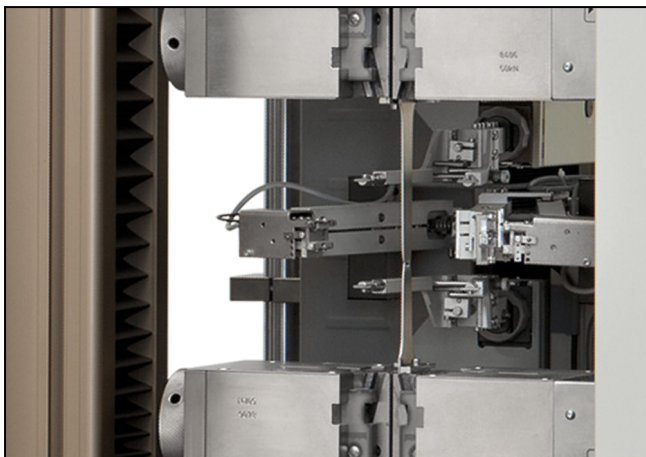
Extensometer (inductive) for measurement of fine strain

Type	Fine strain extensometer	Fine strain extensometer
Item No.	056895	058001 ¹⁾²⁾
Accuracy to EN ISO 9513	Class 0.5	Class 0.5
Measurement signal	Mean value	Two separate signals
Initial gauge length L_0	20 or 50	20 or 50
Measurement travel		
Tensile tests	2.0	2.0
Compression tests	1.5	1.5
Measured value-resolution	depends on machine electronics, see machine electronics resolution	Depends on machine electronics, see machine electronics resolution
Minimum version	from testXpert V11.0	from testXpert V11.0
Ambient temperature	+10 to +35	+10 to +35

1) **2X USC module** required (two separate signals)

2) Suitable for DIN EN ISO 6892-1:2017 Appendix G

CTA: 44270



Fine strain and transverse strain extensometers