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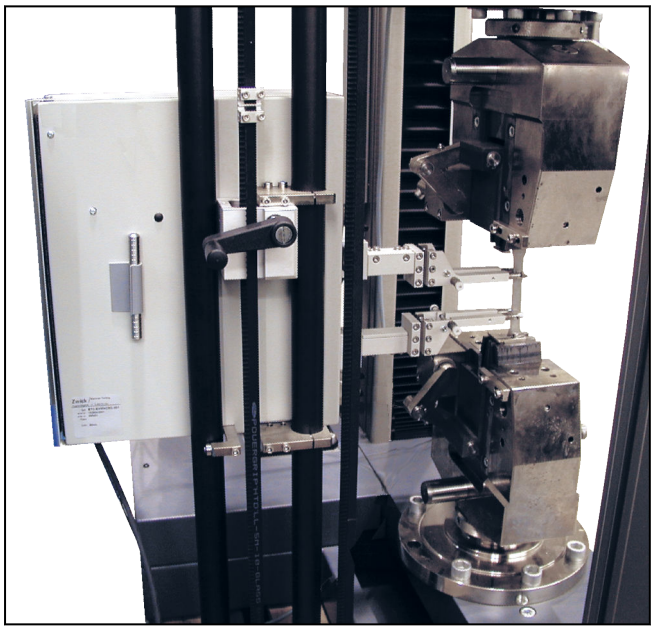
Product Information

makroXtens II

CTA: 44098 44269



makroXtens II

Applications

makroXtens II is a universal, high resolution extensometer for tensile, compression, flexure and cyclic tests on plastics, composites, hard foam materials and metals that have low to average specimen strain.

The measuring system can be used for measurements inside and outside of temperature conditioning devices and climatic chambers.

Advantages and features

- With an installed base of over 7500 systems, makroXtens II is the standard extensometer in the metals, plastics and automotive industries.
- Robust measuring system, also suitable for use in automated testing systems.
- Can be used up to specimen break, even with high loads and brittle specimen material.
- Optimum system protection provided by integrated safety mechanism and tilting knife-edges.
- Accuracy Class 0.5 to EN ISO 9513
- Maximum error ±1 µm in the differential displacement measurement between two measurement points in the range of 20 µm to 200 µm, fully satisfying the additional requirement stipulated by ISO 527-1 (2011)
- makroXtens II is calibrated from a measurement travel of 20 µm in class 0.5
- Extremely low sensor-arm drag force (< 0.05 N)
- Sensor arms can be replaced quickly without any tools.
- Knife edges can be set for round or flat specimens through simple rotation
- Sensor arm contact pressure can be freely adjusted
- Compression and flexure tests can be performed by simply changing the sensor arms
- Automatic, specimen-central tracking by measuring system provides large, constant measuring range. Maximum measurement travel is always available
- Measurement accuracy is specifically increased further in the initial measurement range by an intelligent, patent-pending drag fixture (HP version).
- The HP version is approved for closed loop strain rate control to ISO 6892-1 (2009) Method A (1) and to ASTM E8 – 09 Method B
- Deformation of the specimen is recorded in the elastic and plastic deformation range throughout the entire test until specimen break
- Very high resolution and measurement accuracy over the entire measurement range
- An EtherCAT interface is integrated into the machine electronics and extensometer as standard, eliminating the need for an additional measurement module.
- Measured values from makroXtens are transmitted at the full testControl II data acquisition rate, ensuring that sufficient measured values are available even in rapid, short-duration tests.

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- The maktroXtens II HP with 300 mm-long sensor arms has a resolution of 0.006 µm, enabling the extensometer to continue to supply a sufficient number of measured values for tests with minimal strains/extensions (e.g. tests on ceramics, high-strength or brittle materials). This high resolution is also advantageous for strain control to ISO 6892 Method A (1).
- makroXtens II can be combined with the motorized fine strain extensometer, allowing highly accurate initial range strain measurement to be performed separately on each side of the specimen. This is extremely important, for example, for measuring Young's modulus on metals.
- All makroXtens II extensometers are fully upgradeable (automatic gauge-length adjustment, sensor arms for tensile, compression, flexure and temperature testing, transverse strain extensometer, fine-strain extensometer). Retrofits can be carried out quickly and easily on-site.

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Technical data

makroXtens II for mounting to AllroundLine materials testing machine. Direct connection via the test Control II EtherCAT interface. No additional module or module bus slots required. Resolution in connection with sensors with arm length

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 makroXtens versions.

Type **Item No.**	**makroXtens II 100, P** **083938**	**makroXtens II 100, HP** **083939**	**makroXtens II 100, CFRP/ GFRP** **1005677**	**makroXtens II 205, P** **083940**	
Accuracy to EN ISO 9513			Class 0.5 (1)[1)]		
Drag force	≤ 0.05	≤ 0.05	≤ 0.05	≤ 0.05	N
Resolution in conjunction with:					
300 mm sensor arm length	0.06	0.006	0.006	0.06	µm
450 mm sensor arm length	0.09	0.009	0.009	0.09	µm
600 mm sensor arm length	0.12	0.012	0.012	0.12	µm
Initial gauge length, max.	Up to 100[2)]	Up to 100[2)]	Up to 100[3)]	Up to 205[2)]	mm
Specimen thickness/diameter, max.	30[4)]	30[4)]	30	30[4)]	mm
Dimensions:					
Height	380	380	380	480	mm
Width	120	120	120	120	mm
Depth	375	375	375	375	mm
Weight, approx.			10		
Minimum version			testXpert II V3.6 or testXpert III		

1) Accuracy Class 0.5 when using sensor arms with a length of 300 mm and 450mm, an L0 adjustment range of 100 mm, 205 mm, and 300. Accuracy Class 1 when using longer sensor arms.

2) Initial gauge length 5 mm or greater possible with corresponding sensor (10 mm as standard) The maximum value is thereby reduced by 5 mm.

3) Initial gauge length, min. see sensor arm

4) Standard is 30 mm; up to 110 mm with corresponding sensor

Type **Item No.**	**makroXtens II 205, HP** **083941**	**makroXtens II 300, P** **083942**	**makroXtens II 300, HP** **083943**	
Accuracy to EN ISO 9513		Class 0.5 (1)[1)]		
Drag force	≤ 0.05	≤ 0.05	≤ 0.05	N
Resolution in conjunction with:				
300 mm sensor arm length	0.006	0.06	0.006	µm
450 mm sensor arm length	0.009	0.09	0.009	µm
600 mm sensor arm length	0.012	0.12	0.012	µm
Initial gauge length, max.	Up to 205[2)]	Up to 300[2)]	Up to 300[2)]	mm
Specimen thickness/diameter, max.	30[3)]	30[3)]	30[3)]	mm

All data at ambient temperature.

Subject to change in the course of further development.

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Type Item No.	makroXtens II 205, HP 083941	makroXtens II 300, P 083942	makroXtens II 300, HP 083943	
Dimensions:				
Height	480	620	620	mm
Width	120	120	120	mm
Depth	375	375	375	mm

1) Accuracy Class 0.5 when using sensor arms with a length of 300 mm and 450mm, an L0 adjustment range of 100 mm, 205 mm, and 300. Accuracy Class 1 when using longer sensor arms.

2) Initial gauge length 5 mm or greater possible with corresponding sensor (10 mm as standard) The maximum value is thereby reduced by 5 mm.

3) Standard is 30 mm; up to 110 mm with corresponding sensor

Accessories required

Sensor arms for tensile tests

Item No.	325868	325870	325872	325874[1)2)]	1094288	
Sensor arm length	300	450[3)]	600[3)]	300	600[3)]	mm
Initial gauge length, min.	10	10	10	5[4)]	10	mm
Specimen grip separation, min.	26	26	26	26	26	mm
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
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 1 from L_0 20 mm	
Measurement travel of the sensor arm	75	112.5	150	75	150	mm
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 grips for grip to grip separation > 20 mm are required. Adaptation to makroXtens II with automatic setting of the initial gauge length L_0 upon request only.

2) Only Service may perform retrofitting

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. L_0 value decreases by 5 mm.

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	makroXtens II P und CFK/GFK	makroXtens II HP
Fixed mounting set makroXtens II	Test position: 90° rear center with	Test position: 90° rear center with	1089346	1089347

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Description	Table-top testing machine with AR 440 mm	Table-top testing machine with AR 640 mm	makroXtens II P und CFK/GFK	makroXtens II HP
	sensor arms 300 mm	sensor arms 300 mm		
Fixed mounting set makroXtens II (+ TEE)	Test position: 45° rear left with sensor arms 450 mm	Test position: 45° rear left with sensor arms 600 mm	1089348	1089349
Swivel mounting set makroXtens II (+ TEE)	Two test positions: 90° rear center with sensor arms 300 mm 45° rear left with sensor arms 450 mm	Two test positions: 90° rear center with sensor arms 300 mm 45° rear left with sensor arms 600 mm	1089350	1089351
Swivel mounting set makroXtens II (+ TEE and mounting platform)	-	Two test positions: 90° rear center with sensor arms 300 mm 45° rear left with sensor arms 600 mm Extended swivel capability for full use of mounting platform 600 x 600 mm	1089352	1089353

Mounting variations for floor-standing testing machines:

Description	Floor-standing testing machine with AR 640 mm	Floor-standing testing machine with AR 1040 mm	makroXtens II P und CFK/GFK	makroXtens II HP
Fixed mounting set makroXtens II	Test position: 90° rear center with sensor arms 300 mm	Test position: 90° rear center with sensor arms 300 mm	1039415	1031328
Fixed mounting set makroXtens II (+ TEE)	Test position: 45° rear left with sensor arms 600 mm	-	1065233	1065235
Swivel mounting set makroXtens II (+ TEE)	Two test positions: 90° rear center with sensor arms 300 mm 45° rear left with sensor arms 600 mm	-	1047184	1047298
Swivel mounting set makroXtens II (+ TEE and mounting platform)	Two test positions: 90° rear center with sensor arms 300 mm 45° rear left with sensor arms 600 mm Extended swivel capability for full use of mounting platform 600 x 600 mm	Two test positions: 90° rear center with sensor arms 300 mm 45° rear left with sensor arms 600 mm Extended swivel capability for full use of mounting platform 850 x 1000 mm	1067371	1067372
Swivel mounting set makroXtens II (+ TEE and mounting platform)	Two test positions: 90° rear center with sensor arms 450 mm 45° rear left with sensor arms 600 mm The mounting platform 600 x 600 mm is fully usable in both test positions.	-	1067373	1067374

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Mounting variations for floor-standing testing machine Z250 SNS:

Description	Floor-standing testing machine with AR 640 mm	Floor-standing testing machine with AR 1040 mm	makroXtens II P und CFK/GFK	makroXtens II HP
Swivel mounting set makroXtens II	Two test positions (both test areas): 90° rear center with sensor arms 300 mm	-	1069307	1069308

Optional accessories

Mechanical transverse strain extensometers

Transverse strain extensometers can be used in a temperature range of +10 ... +35 °C. All transverse strain extensometers can only be used in conjunction with the AllroundLine and with the 300 mm sensor arms for tensile tests (325868 oder 325874). Transverse strain extensometers can be used for *r*- and *n*-value determination. If the 90° swivelable transverse strain extensometer is swiveled away, it can reach a L_0 of > 5 mm, or if attached to the specimen, the L_0 will increase to > 50 mm!

The manual transverse strain extensometers are connected to the control circuit board directly on the makroXtens II.

Type	Item No.	Measuring lines	Resolution [µm]	Measurement travel [mm]	Initial gauge length [mm]	Specimen width [mm]	Specimen thickness, max. [mm]	Contact forces [N]
Can be swiveled out 90°, without mechanical switchover	084635[1)]	1	0.1	0 ... 6	≥ 10/5[2)]	10 ... 25.4	4	0.5 ... 0.7
Can be swiveled out 90°, without mechanical switching	084636[1)3)]	1	0.002	0 ... 6	≥ 10/5[4)]	10 ... 25.4	4	0.5 ... 0.7
Can be swiveled out 90°, without mechanical switchover	082678[1)]	2	0.1	0... 6	≥ 10/5[4)]	10... 25.4	4	0.5... 0.7
Can be swiveled out 90°, without mechanical switchover	084634[1)]	2	0.002	0 ... 6	≥ 10/5[4)]	10 ... 25.4	4	0.5 ... 0.7
Can be swiveled out 90°, without mechanical Switchover	060702[1)]	4	0.1	0 ... 6	≥ 10/5[4)]	10 ... 25.4	4	0.5 ... 0.7
Can be swiveled out 90°, without mechanical Switchover	061253[1)]	4	0.002	0 ... 6	≥ 10/5[4)]	10 ... 25.4	4	0.5 ... 0.7

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Type	Item No.	Measuring lines	Resolution [µm]	Measurement travel [mm]	Initial gauge length [mm]	Specimen width [mm]	Specimen thickness, max. [mm]	Contact forces [N]
Can be swiveled out by 15°, for varying specimen widths[5)]	084637	2	0.1	4 ... 9	≥ 50[4)]	10 ... 15/20 ... 25.4	4	1.5 ... 2
Can be swiveled out by 15°, for varying specimen widths[5)]	084638	2	0.002	4 ... 9	≥50[4)]	10 ... 15/20 ... 25.4	4	1.5 ... 2

1) Not in conjunction with fine strain extensometers (item numbers 056895 and 058001)
2) see multiXtens II sensor arm Initial gauge length
3) You can determine **Poisson's ratio** only with the transverse strain extensometer item no. 084636.
4) see makroXtens II sensor arm Initial gauge length
5) Through mechanical switching

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

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**

Description	ArticleNumber
Mounting kit for videoXtens transverse strain extensometer - for mounting on makroXtens II[1)]	**013613**

1) For sensor length 300 mm only.