Product Information

Electrodynamic testing machine LTM 1 / 2 / 3 Torsion

CTA: 273156

Electrodynamic testing machine LTM 3 Torsion

Application

The LTM with torsion drive is an electrodynamic testing machine with a drive based on linear motor technology. ZwickRoell's newly developed patented drive concept allows the testing system to be used for a variety of dynamic materials and components tests with a high level of flexibility. The low moving mass of the drive provides ideal conditions for fatigue tests.

With its oil-free drive technology, the electrodynamic testing machine is predominantly used for components testing in the medical industry, such as standard-compliant tests on hip, knee or dental implants.

Other typical applications include fatigue tests on standard plastics and composites specimens or on components such as rubber/metal joints. The testing system can also be used for fracture mechanics investigations on aluminum and plastic CT and SEB specimens. The newly developed torsion drive allows for the performance of purely axial, purely torsional and superimposed tests.

Intuitive operation via our testXpert R software makes the LTM a genuinely versatile machine, ideally suited for research and teaching at university level.

Features

- Also suitable for static testing due to extremely quiet operation.
- Fatigue-resistant, wear-free braking system for piston clamping.
- High-precision, fatigue-resistant two-column test frame with integrated T-slotted platform and collection trough.
- Integrated cooling system as standard.
- Precise control via 10kHz frequency, enabling rapid reaction to spontaneous events
- Electrically interlocked safety enclosure for compliance with EC Machinery Directive.
- The torsion drive was developed for high-resolution angle measurement and high positioning accuracy.
- The torsion drive supports a high number of rotations and can be operated at a speed of 100 1/min.

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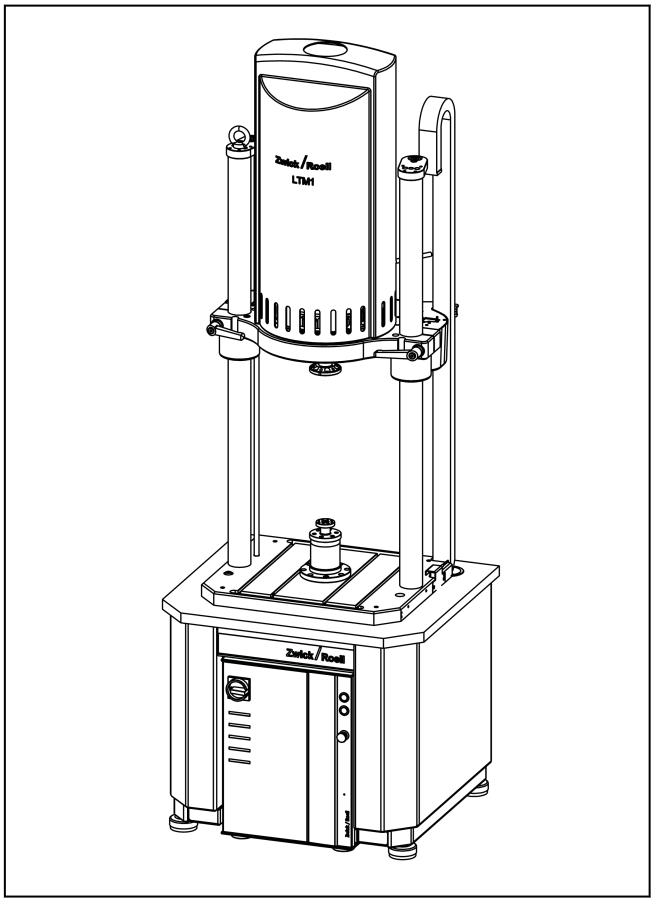
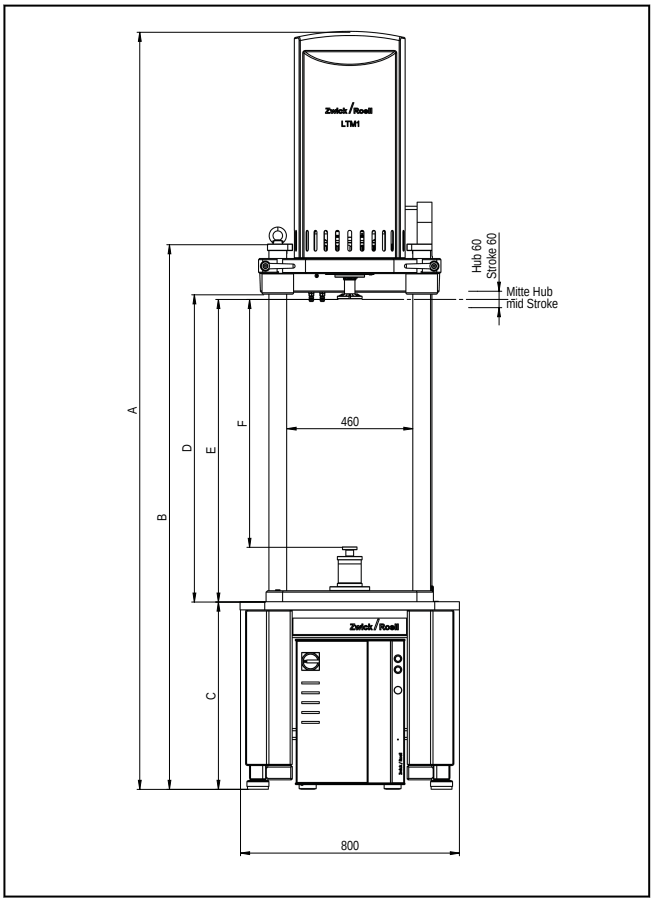
Advantages

- High dynamic performance due to low moving mass
- The wide speed range allows for dynamic fatigue tests as well as slow static tests.
- Maintenance and adjustment free brake for mechanical piston clamping.
- No additional pneumatic, coolant, oil etc. supply feeds required.
- Motor-driven crosshead adjustment for convenient operation.
- Safe setup mode according to EN 60204-1 via speed reduction to 10 mm/s and 24°/s.
- Precise and low-wear bearing of the piston rod.
- Simple manual crosshead locking via hand lever with electrical monitoring.
- Long piston-stroke (60 mm) enables wide variety of tests
- The torsion drive can generally be retrofitted.
- The torsion drive is mechanically designed for infinite rotation.
- Operator-friendly testXpert R testing software with preset controller settings and availability of free controller definition for individual testing requirements
- Intelligent testing software featuring intuitive operation: testXpert R for dynamic tests.
- Flexible use of specimen grips and fixtures over the entire dynamic product range
- The patented electromagnetic drive was designed specifically for the speed range relevant to testing technology and features exceptionally quiet operation, optimum control quality and extremely high positioning accuracy
- The travel measuring system is coaxial and mounted near the specimen in the piston rod, enabling high positioning repeatability and precise piston travel measurement.

CTA: 273366 273369



Drawing: Testing machine LTM 1 Torsion



Drawing: Dimensions for testing machine LTM 1 Torsion

All data at ambient temperature.

Subject to change in the course of further development.

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Electrodynamic testing machine LTM 1 / 2 / 3 Torsion

Type **Item No.**	**LTM 1 T + 400 mm[1)]** **3014181**	**LTM 2 T + 400 mm[1)]** **3014182**	**LTM 3 T + 400 mm[1)]** **3014183**	
Test load F_{max} dynamic	± 1000	± 2000	± 3000	N
Test load F_{max} static, continuous	± 700	± 1400	± 2100	N
Maximum frequency[2)]	100	100	100	Hz
Piston stroke	60	60	60	mm
Speed range	2	2	1.5	m/s
Positioning accuracy and repeatability	± 2	± 2	± 2	µm
Torsion drive				
Moment, dynamic	± 10			Nm
Moment, static continuous	± 7			Nm
Rotations	± 500			
RPM, max.	100			1/min
Moment, dynamic		± 20	± 30	
Moment, static continuous		± 14	± 21	
Rotations		± 500	± 500	
RPM, max.		100	100	
Test frame				
Test area				
Test area width			460	
Test area width	460			mm
Test area				
Test area width		460		
Overall height of testing machine, max. (A)	2775	2775	2775	mm
Overall height of the test frame, max. (B)	1988	1988	1988	mm
Overall width	800	800	800	mm
Overall depth	700	700	700	mm
Height of mounting table (C)	692	692	692	mm
Column diameter	65	65	65	mm
Frame stiffness at 1000mm crosshead separation	24	24	24	kN/mm
Overall weight[3)]	510	510	550	kg
Test area height, max. (D)	1125	1125	1125	mm
Test area height without load cell, max. (E)[4)]	1065	1065	1065	mm
Test area height with load cell, max. (F)[4)]	905	905	905	mm
Top crosshead adjustment		Motorized		
Top crosshead clamping		Manual		
Crosshead clamping electrically monitored		Yes, with signal indicator		
General information				
Max. noise level at 1 m distance[5)]	< 63		< 63	dB(A)
Typical noise level at 1 m distance[5)]	< 46		< 46	dB(A)

All data at ambient temperature.

Subject to change in the course of further development.

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Type	LTM 1 T + 400 mm[1)]	LTM 2 T + 400 mm[1)]	LTM 3 T + 400 mm[1)]
Item No.	**3014181**	**3014182**	**3014183**
Max. noise level at 1 m distance[5)]		< 63	
Typical noise level at 1 m distance[5)]		< 46	

1) Extended load frame - base frame (1055466) and supplementary mass (1055467) are absolutely necessary
2) Depending on load ratio (r-ratio) and test amplitude
3) Testing machine with base only, without electrical cabinet, tools, and options
4) Middle piston position
5) Depending on the required output, the environment, test arrangement, type of test, frequency of the specimen, determined in a free field in accordance with DIN EN ISO 11205

Electronics

testControl II measurement and control electronics		
Control frequency	10 kHz	
Measured-value acquisition	10 kHz, 24 bits, arithmetical	
Slots	5 x module bus[1)]	
PC interface	GigaBit Ethernet	
Integrated safety concept	- 2-channel specification for maximum safety - interface for interlocked safety doors - Emergency Stop link interface	
Display-equipped remote control	set-up or testing mode - Emergency Stop button - Key switch for switching between setup and testing modes	
Dimensions		
Height	550	mm
Width	400	mm
Depth	520	mm
Weight, approx.	70	kg
Cable length between test frame and machine electronics	500	mm
Protection class	IP 54	

1) Three freely allocatable slots

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Installation conditions

Type	LTM 1 / 2 / 3	
Operating temperature	+10 ... +30	°C
Storage temperature	-25 ... +50	°C
Humidity (non-condensing)	20 ... 90	%
Electrical connection		
Power supply voltage	400	V
Power frequency	50/60	Hz
Power	11	kVA
Back-up fuse	16	A
Plug with 5 m cable	CEE	
Integrated ambient air cooling unit		
Exhaust air temperature[1)]	0 ... 2	kW
Air circulation volume, max.	2320	m^3/h
Minimum spacing rear of machine - wall	600	mm

1) Depending on output required

Air-spring elements

For reduction of vibrations, shocks and structure-borne noise

Description	ArticleNumber
Height A, B, C + approx. 50 mm	**3001895**

Load cell

Description	ArticleNumber
Nominal force ± 1 kN / ± 10 Nm[1)]	**3014184**
Nominal force ± 2 kN / ± 20 Nm[2)]	**3014185**
Nominal force ± 3 kN / ± 30 Nm[3)]	**3014186**

1) Accuracy class 1 (force from 10 N / torque from 0.4 Nm) to ISO 7500-1
2) Accuracy class 1 (force from 20 N / torque from 0.8 Nm) to ISO 7500-1
3) Accuracy class 1 (force from 30 N / torque from 1.2 Nm) to ISO 7500-1

Safety devices

Description	ArticleNumber
LTM 1 / 2 / 3 kN: 4-sided safety device made of steel sheet, safety door in front with Makrolon sheets, electrically monitored and interlocked, standard height	**1055506**

Options

Description	ArticleNumber
Table-top model	**Standard**
Base (~85 kg)	**1055466**
Supplementary mass (+60 kg) for particularly dynamic applications	**1055467**
Air spring elements - for reduction of vibrations, shocks and structure-borne noise[1)]	**3001895**
Tool set for equipping and setting up the testing machine	**1036089**

1) Overall height increases by approx. 50 mm