

## Product Information

### Electrodynamic Testing Machine LTM 5 and LTM 10 Torsion

CTA: 273157



Electrodynamic testing machine LTM 10 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 super-imposed 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.

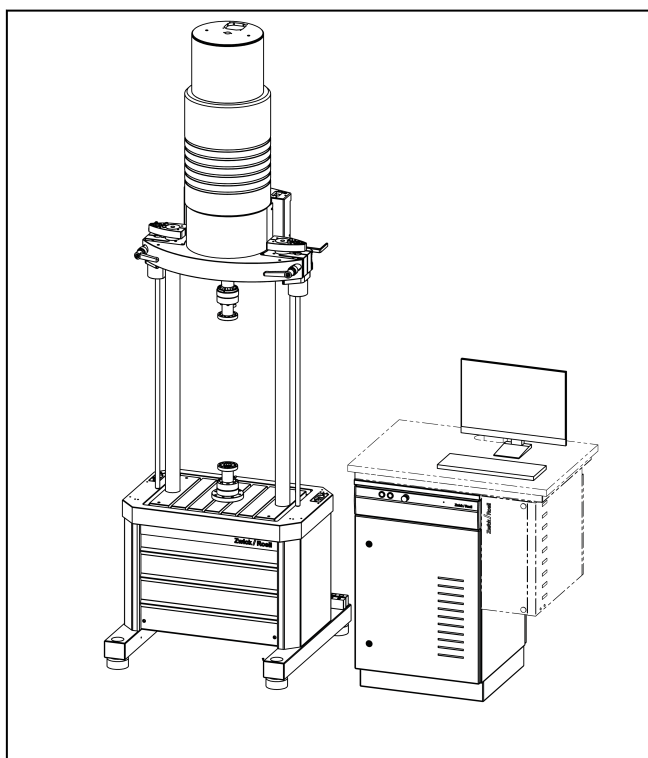
## Product Information

### Electrodynamic Testing Machine LTM 5 and LTM 10 Torsion

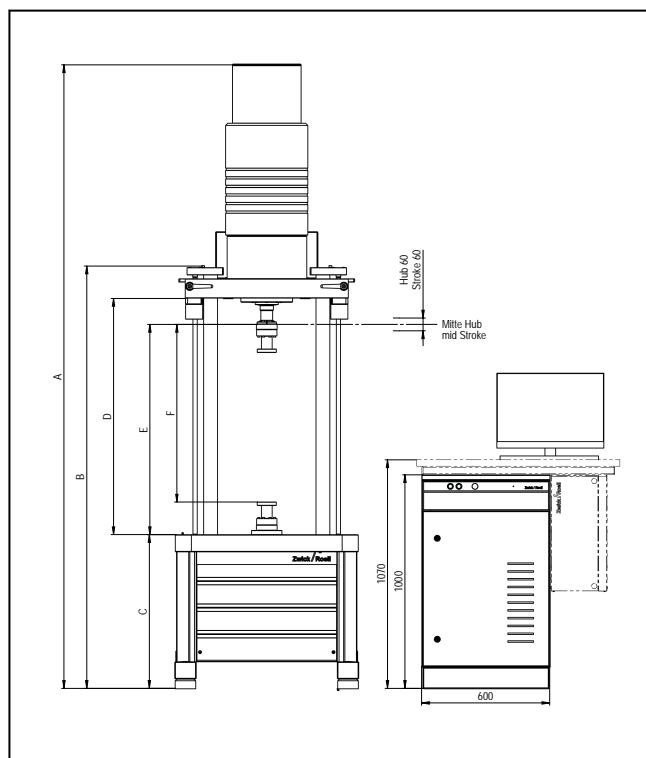
#### Advantages

- 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: 273370 273371



Drawing: Testing machine LTM 10 Torsion with electronics



Drawing: Dimensions for testing machine LTM 10 Torsion with electronics

## Product Information

### Electrodynamic Testing Machine LTM 5 and LTM 10 Torsion

#### Technical data

Type Item No.	LTM 10 T Standard 3011465	LTM 10 T + 250 mm 3011466	
Test load $F_{max}$ dynamic	± 10000	± 10000	N
Test load $F_{max}$ static, continuous	± 7000	± 7000	N
Maximum frequency <sup>1)</sup>	100	100	Hz
Piston stroke	60	60	mm
Speed range	1	1.5	mm/min
	1.0		m/s
Positioning accuracy and repeatability	± 2	± 2	µm
<b>Torsion drive</b>			
Moment, dynamic	± 100	± 100	Nm
Moment, static continuous	± 70	± 70	Nm
Rotations	± 500	± 500	
RPM, max.	100	100	1/min
<b>General information</b>			
Max. noise level at 1 m distance <sup>2)</sup>	< 68	< 68	dB(A)
<b>Test frame</b>			
Overall height of testing machine, max. (A)	2919	3169	mm
Overall height of the test frame, max. (B)	1980	2230	mm
Overall width	860	860	mm
Overall depth	850	850	mm
Height of mounting table (C)	720	720	mm
Column diameter	65	65	mm
Frame stiffness at 1000mm crosshead separation	300	300	kN/mm
Overall weight <sup>3)</sup>	1100	1125	kg
<b>Test area</b>			
Test area width	460	460	mm
Test area height without load cell, max. (E) <sup>4)</sup>	983	1233	mm
Test area height with load cell, max. (F) <sup>4)</sup>	830	1080	mm
Top crosshead adjustment		Motorized	
Top crosshead clamping		Manual	
Crosshead clamping electrically monitored		Yes, with signal indicator	

1) Depending on load ratio (r-ratio) and test amplitude

2) 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

3) Testing machine with base only, without electrical cabinet, tools, and options

4) Middle piston position

## Product Information

### Electrodynamic Testing Machine LTM 5 and LTM 10 Torsion

#### Electronics

testControl II measurement and control electronics		
Control frequency	10 kHz	
Measured-value acquisition	10 kHz, 24 bits, arithmetical	
Slots	5 x module bus <sup>1)</sup>	
PC interface	GigaBit Ethernet	
Integrated safety concept	<ul style="list-style-type: none"> <li>- Two-channel specification for maximum safety</li> <li>- Interface for interlocked safety doors</li> <li>- Emergency Stop link interface</li> </ul>	
Display-equipped remote control	<ul style="list-style-type: none"> <li>- Setup or testing mode</li> <li>- Emergency Stop button</li> <li>- Key switch for switching between setup and testing modes</li> </ul>	
Dimensions		
Height	1000	mm
Width	600	mm
Depth	600	mm
Weight, approx.	120	kg
Cable length between test frame and machine electronics	500	mm
Protection class	IP 54	

1) Three freely allocatable slots

#### Installation conditions

Type	LTM 5	LTM 10	
Operating temperature	+10 to +30	+10 to +30	°C
Storage temperature	-25 to +50	-25 to +50	°C
Humidity (non-condensing)	20 to 90	20 to 90	%
Electrical connection			
Power supply voltage	400	400	V, 3 Ph/N/PE
Power frequency	50/60	50/60	Hz
Output	11.1	22.17	kVA
Back-up fuse	16 T	32 T	A
CEE plug with 5 m cable	16	32	A
Integrated cooling unit using ambient air			
Exhaust air temperature <sup>1)2)</sup>	0.5-2.5	0.5-5	kW
Max. air circulation volume	2360	2360	m <sup>3</sup> /h
Minimum spacing rear of machine - wall	600	600	mm

1) Depending on output required

2) In conjunction with integrated cooling unit using ambient air, Item No. 3001889

## Product Information

### Electrodynamic Testing Machine LTM 5 and LTM 10 Torsion

#### Air-spring elements

For reduction of vibrations, shocks and structure-borne noise

Description	ArticleNumber
Height A, B, C + approx. 50 mm	<b>3001895</b>

#### Load cell

Description	ArticleNumber
Nominal force $\pm 5$ kN / $\pm 50$ Nm <sup>1)</sup>	<b>3014518</b>
Nominal force $\pm 10$ kN / $\pm 100$ Nm <sup>2)</sup>	<b>3013089</b>

1) Accuracy class 1 (force from 20 N / torque from 1.25 Nm) to ISO 7500-1

2) Accuracy class 1 (force from 40 N / torque from 2 Nm) to ISO 7500-1

#### Safety devices

Description	ArticleNumber
LTM 5 and 10 kN: 4-sided safety device made of steel sheet, front safety door with Makrolon panel, electrical monitoring and interlocking, increased-height version + 250 mm	<b>1020533</b>

#### Increased total weight

Suitable for applications with higher frequencies and stiff specimens, plus long strokes with high acceleration

Description	ArticleNumber
Total weight + approx. 600 kg; height A, B, C + approx. 180 mm	<b>3001891</b>

#### Cooling units

ZwickRoell offers the following options to suit different environmental conditions in the testing lab:

Description	ArticleNumber
<ul style="list-style-type: none"> <li>No additional pneumatic, coolant, oil etc. supply connections required</li> <li>Maximum energy output to the environment:               <ul style="list-style-type: none"> <li>LTM 5: 2.5 kW<sup>1)</sup></li> <li>LTM 10: 5 kW<sup>1)</sup></li> </ul> </li> </ul>	<b>3001889</b>
Integrated unit for coolant supply connection (option) <ul style="list-style-type: none"> <li>Suitable to keep the room heating and noise level low</li> <li>For customer-supplied connection to coolant</li> </ul>	<b>3001890</b>
External coolant system for LTM (option) <ul style="list-style-type: none"> <li>Suitable to keep the room heating and noise level low</li> <li>Specially designed for use at high ambient temperatures</li> <li>For covered installation outside the test area</li> </ul>	<b>087110</b>

1) Depending on the output required