

Static Electromechanical Universal Testing Machines



Static Electromechanical Universal Testing Machines for Load Capacities 0.5 - 600 kN

Testing machines for accurate, repeatable and reliable results of tensile, compression, flexure, peel, shear, tear or friction tests on a wide range of different materials for quality control, product development, research or process development.

w+b can provide single column tabletop or dual column floor standing models with different load capacities.

w+b electromechanical testing systems are modular constructed and can be configured with a variety of grips and fixtures, extensometers, different software packages and other accessories to suits your specific testing needs.



Series LFM - L
0.5 - 20 kN



Series LFM - C
0.5 - 50 kN



Series LFM
10 - 125 kN



Series LFM - H
150 - 600 kN



Series LFMZ
10 - 500 kN



Series EC
0.5 - 50 kN

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Electromechanical Low Capacity Universal Testing Machines

Series LFM – L 1 – 20 kN

Single column, table top universal testing machines for low load capacities up to 20 kN. Ergonomically designed testing machines for tensile, compression, bending, sheer or peel but also strain and other more advanced tests on a wide range of different materials.



The Series LFM-L of universal testing machines are designed for testing of a variety of different materials, specimens or components where load requirements are low. This series is compatible with a wide range of accessories, grips and fixtures covering all relevant applications as testing of rubber, plastics, foils, films, textiles, adhesives, paper, foods, foams, timber, wires or other metallic or non-metallic specimens and medical, electronic and other components.

Load Frame

The load frames are rigid constructed, with high axial and lateral stiffness. The linear module with multiple guided, backlash-free ball screw assembly with anodised aluminium frame combines high performance with compact dimensions. The backlash-free ball screw assembly provides high load capacity, high positioning accuracy and repeatability. It allows not only tests in tension or compression direction but also through zero testing. The linear modules are protected by corrosion-resistant steel strips which are easy to clean and also resistant against high temperature. The machine is equipped with multiposition limit detectors for the best protection of operator, test sample and machine. Additional the load frame has two, an electronic and mechanical overload protection.

The backlash-free linear modules are digital controlled by a servomotor for faster starts and stops, best control, and highest accuracy. The crosshead position can easily be changed between three positions to enlarge the usable test space.

These compact workstations offer force, displacement or deformation closed loop testing. It combines high performance with compact dimensions.

Specifications

- Accuracy

In accordance with ISO 7500-1 and EN 10002-2, Grade 0.5.
- Control

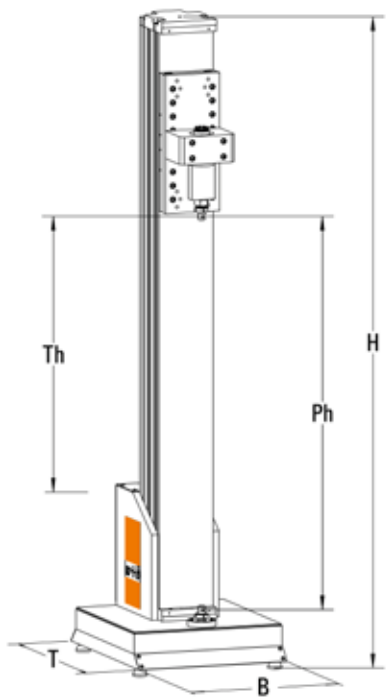
Standard: force and displacement closed loop controlled.
Option: with extensometer strain closed loop controlled.
- Test Speed

Standard: 0.001 mm/min up to 2000 / 1000 / 350 mm/min.
Depending on application. All others available upon request.
- Crosshead Travel

Standard: 1000 mm. Others available upon request.
- T-Slots in Base Platen

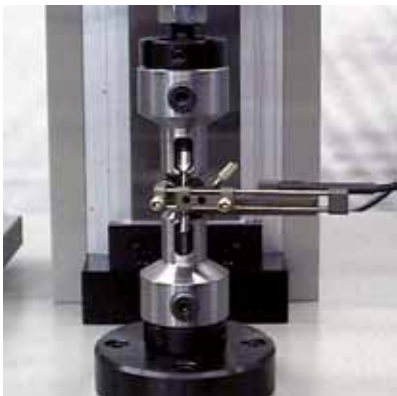
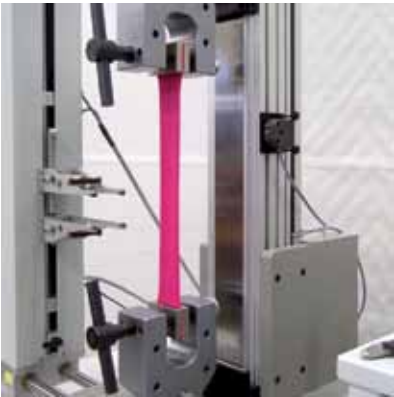
Optional to fix components, specimens, assemblies a.s.o.
- Power Requirements

230 V, 50 Hz. Others upon request.



Type LFM - L		0.5 / 1	2	5	10	20
Max. Test Load Static	kN	1	2	5	10	20
Max. Test Speed	mm/min	2000	2000	1000	1000	350
Crosshead Travel (Th)	mm	1000	1000	1000	1000	1000
Max. Distance between Spigots (Ph)	mm	1150	1150	1150	1150	1200
Spigot Diameter	mm	20	20	20	20	20
Width (B)	mm	350	350	350	350	450
Depth (T)	mm	450	450	450	450	600
Height (H)	mm	1650	1650	1650	1650	1900
Weight*	kg	120	120	120	120	250
Frame Stiffness	kN/mm	20	20	20	20	40

* varies with grips



Compact Electromechanical Table - Top Testing Machines

Series LFM – C 0.5 - 50 kN

The ideal solution for testing applications with small or medium displacements as compression, bending or shear testing.

Suitable grips or fixtures can be mounted quick and easy onto the standard spigots with pin or onto the T-slot platen.

The frame of the Series LFM-C of testing machines features a central ball screw electro-thrust cylinder assembly that also allows very short movements due to the absence of stick-slip effects.

The inline mounted drive with motor provides high responsive control with minimum back-

lash. The frame features very high stiffness with a lower T-slot platen suitable to fix grips or fixtures, components, specimens, manufactured assemblies or finished goods. The cross-head is available in fixed position or movable with manual clamping.



Specifications

- Accuracy

In accordance with ISO 7500-1 and EN 10002-2, Grade 0.5.
- Control

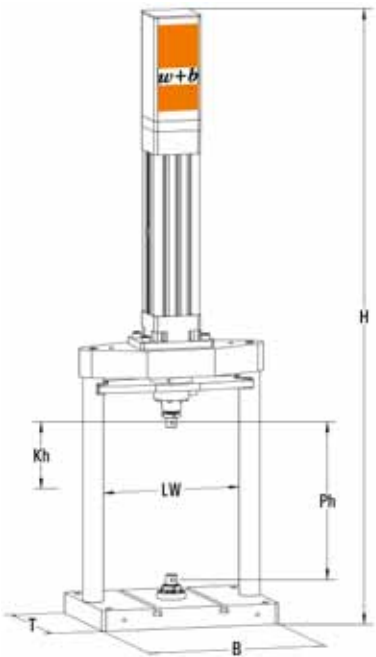
Standard: force and displacement closed loop controlled.
Option: with extensometer strain closed loop controlled.
- Test Speed

Standard: 0.001 mm/min up to 200 mm/min.
Depending on application. All others available upon request.
- Crosshead Travel

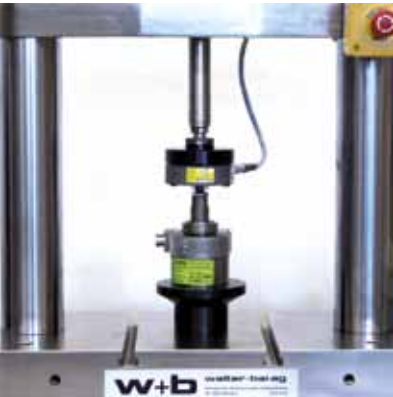
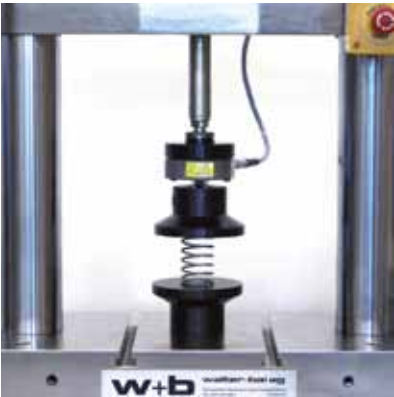
Standard: 200 mm. Others available upon request.
- T-Slots in Base Platen

Standard to fix components, specimens, assemblies a.s.o.
- Power Requirements

230 V, 50 Hz. Others upon request.



Type LFM – C		0.5	2.5	7.5	20	40	50
Max. Test Load Static:	kN	0.5	2.5	7.5	20	40	50
Max. Test Speed	mm/min	200	200	200	200	200	200
Piston Stroke (Th)	mm	200	200	200	200	200	250
Max. Vertical Test Space (Ph)	mm	250	250	250	250	250	500
Distance between Columns (LW)	mm	500	500	500	500	500	400
Spigot Diameter	mm	20	20	20	20	30	30
Width (B)	mm	650	650	650	650	650	530
Depth (T)	mm	250	250	250	250	250	400
Height (H)	mm	1120	1120	1120	1120	1120	1720
Weight (without Grips)	kg	100	100	100	100	100	300
Frame Stiffness	kN/mm	250	250	250	250	250	250



Electromechanical Universal Testing Machines

Series LFM 20 – 125 kN

Floor-standing dual column universal testing machines for load capacities up to 125 kN. These state-of-the-art testing machines using the latest technology providing uncompromising quality and therefore represents a range of accurate and reliable test systems.

These testing machines are mostly the choice of this in the metals, fastener, composites, wood, geotextile, cable, forging, adhesive and civil industries or in R & D laboratories and universities where specimen size and strength require higher force capacities. This series of

testing machines are driven by a high responsive AC-brushless servomotor with high start up torque. The backlash-free ball screws providing high load capacity, high positioning accuracy and repeatability. The lower base platen is also available with T-slots suitable

to fix components, specimens, manufactured assemblies or other accessories. The LFM are available with different standard configurations. All options as extended lateral test space or environmental chambers, other crosshead travels, additional low force transducers etc. are available. This series of testing machines can also be extended with a second test area.

Load Frame

The Series LFM load frames are rigid constructed, providing superior axial and lateral stiffness. The linear modules of Type LFM up to 75 kN are protected by corrosion-resistant steel strips which are easy to clean and also resistant against high temperatures, the models LFM 100 and 125 are equipped with oil and moisture resistant polyurethane coated welded polyester fabric bellows. The backlash-free ball screws are digital controlled by a high responsive AC-brushless servomotor with high start up torque for faster starts and stops, best control, and highest accuracy at a extremely low noise level. It allows not only tests in tension or compression direction but also through zero testing. The linear modules are protected by corrosion-resistant steel strips which are easy to clean and also resistant against high temperature. The machine is equipped with multi-position limit detectors for the best protection of operator, test sample and machine. Additionally the load frame has two, an electronic and mechanical overload protection. The backlash-free linear modules are digital controlled by a servomotor for faster starts and stops, best control, and highest accuracy.



Specifications

- Accuracy

In accordance with ISO 7500-1 and EN 10002-2, Grade 0.5.
- Control

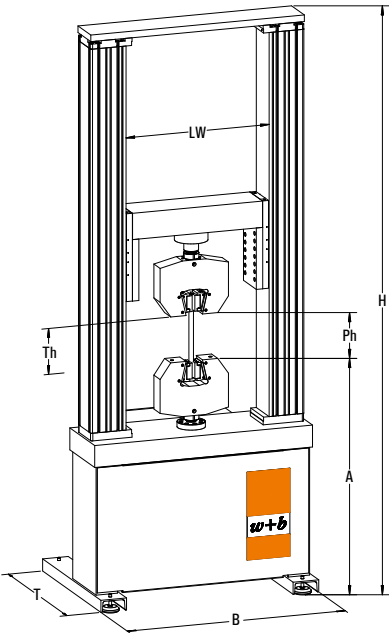
Standard: force and displacement closed loop controlled.
Option: with extensometer strain closed loop controlled.
- Test Speed

Standard: 0.001 mm/min up to 1000 / 500 mm/min.
Depending on application. All others available upon request.
- Crosshead Travel

Standard: 1000 / 1100 mm. Others available upon request.
- T-Slots in Base Platen

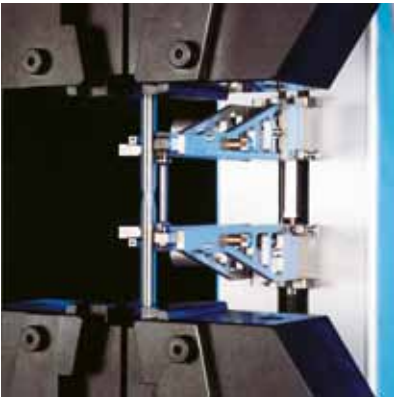
Optional to fix components, specimens, assemblies a.s.o.
- Power Requirements

3 x 400 V, 50 Hz. Others upon request.
230 V, 50 Hz optional for Type LFM 10 / 20 / 25 and LFM 50.



Type LFM		10 / 20 / 25	50	75	100	125
Max. Test Load Static	kN	25	50	75	100	125
Max. Test Speed	mm/min	1000	1000	1000	500	500
Crosshead Travel (Th)	mm	1000	1000	1000	1100	1100
Max. Distance between Spigots (Ph)	mm	1250	1250	1250	1300	1300
Distance between Columns (LW)	mm	500	500	500	600	600
Spigot Diameter	mm	30	30	30	40	40
Working Height (A)	mm	800	800	800	750	750
Width (B)	mm	820	820	820	1020	1020
Depth (T)	mm	750	750	750	750	750
Height (H)	mm	2400	2400	2400	2600	2600
Weight*	kg	500	550	580	850	900
Frame Stiffness	kN/mm	125	125	125	150	150

* varies with grips



Electromechanical High Capacity Universal Testing Machines

Series LFM – H 150 – 600 kN

Floor-standing and rigid 4- or 6-column testing machines for high load capacities up to 600 kN. The Series LFM - H universal testing machines are mostly the choice of this in the metals, fasteners or composites industries where specimen size and strength require high force capacities.

The Series LFM-H testing machines often are the perfect solution for typical applications including testing of large metal specimens, fasteners, composites, cables, forgings, welded joints, geotextiles, polymers and reinforced plastics, civil structure materials, adhesives, components or finished goods. The machines with its preloaded, backlash-free ball screws and heavy duty bearings with additional robust guidance columns features accurate crosshead alignment and are suitable not only for tension or compression test but also through zero

testing.

The load frame is constructed in the way that the upper crosshead is driven so that the lower base platen remains and allows an ergonomic working in seated or standing position at pleasant working height.

Load Frame

The frames are rigid 4- or 6-column constructions, providing superior axial and lateral stiffness. The backlash-free ball screws providing high load capacity, high positioning accuracy and repeatability. It allows not

only tests in tension or compression direction but also through zero testing.

The backlash-free ball screws are digital controlled by a high responsive AC-brushless servomotor with high start up torque for faster starts and stops, best control, and highest accuracy at a extremely low noise level. The machine is equipped with multi-position limit detectors for the best protection of operator, test sample and machine. Additional the load frame has two, an electronic and mechanical overload protection. The ball screws with guidance columns are protected by a high resistant barrels providing reliable operation in industrial environments and when brittle material are tested. The lower base platen is also available with T-slots suitable to fix components, specimens, manufactured assemblies or other accessories. Optional are safety protection for brittle materials and 2nd or 3rd test chamber.



Specifications

- Accuracy

In accordance with ISO 7500-1 and EN 10002-2, Grade 0.5.
- Control

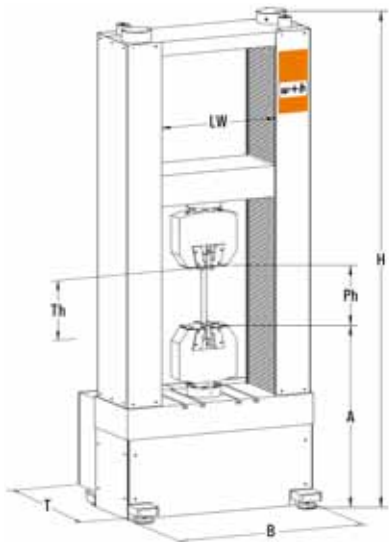
Standard: force and displacement closed loop controlled.
Option: with extensometer strain closed loop controlled.
- Test Speed

Standard: 0.001 mm/min up to 500 / 250 mm/min.
Depending on application. All others available upon request.
- Crosshead Travel

Standard: 1000 / 1500 mm. Others available upon request.
- T-Slots in Base Platen

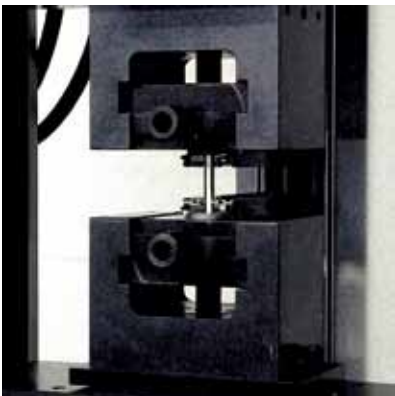
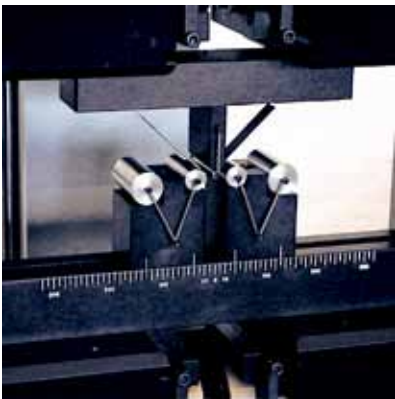
Optional to fix components, specimens, assemblies a.s.o.
- Power Requirements

3 x 400 V, 50 Hz. Others upon request.



Type LFM – H		150	200	250	300	400	500	600
Max. Test Load Static	kN	150	200	250	300	400	500	600
Max. Test Speed	mm/min	500	500	500	500	500	250	250
Crosshead Travel (Th)	mm	1000	1000	1000	1000	1000	1500	1500
Max. Distance between Grips (Ph)*	mm	800	800	800	800	800	800	800
Distance between Columns (LW)	mm	700	700	700	700	700	750	970
Working Height (A)	mm	840	840	720	720	720	750	970
Width (B)	mm	1200	1200	1200	1200	1200	1200	1200
Depth (T)	mm	950	950	1000	1000	1000	1200	1200
Height (H)	mm	2700	2700	2900	2900	2900	2990	3500
Weight*	kg	2500	2600	3000	3150	3300	3500	5100
Frame Stiffness	kN/mm	300	300	400	400	400	600	650

* varies with grips



Compact Testing Machines with Built-in Controlling

Series LFMZ 10 – 50 kN

Testing Machines specially designed for slow-speed applications such as creep or relaxation tests. The Series LFMZ with load capacities ranging from 10 to 50 kN are free standing, space saving and compact machines with all integrated mechanical, electrical and electronic components.

Series LFMZ is designed specially for applications such as creep or relaxation test. The machines are available with installed split furnaces or if no extensometer is needed with sliding furnace for quick and easy changing of samples by moving the furnace up and down. The machines are built in rigid two-hard-chromium plated column construction, precision aligned, movable upper crosshead, mounted on the welded machine's base frame. Servo-controlled testing system with high-resolution ball screw driven central ac-

tuator with prestressed ball nut and backlash free torsion security device. The central ball screw assembly is fully bedded in oil for minimized abrasion and point-load between balls and screw guarantee longest trouble free operation even when small movements are controlled over long term testing. With precision flat load cell for accurate force measurement and control and incremental displacement transducer for accurate displacement measurement and control.

Features

- Compact and space saving design
- Dust protection over full stroke on torsion secure device and central spindle.
- Adjustable max. and min. switches.
- With precision flat load cell for accurate force measurement and control fixed on central screw, and incremental displacement transducer for accurate displacement measurement and control.
- Air-or water cooling system for the load cell for drift-less testing.
- Heat protection shields.
- High quality furnaces with temperatures up to 1600°C in air or inert gas with three zone PID controllers with RS232.
- Furnace can be controlled manual or in automatic mode through digital controller.
- Including thermocouples with cables and plugs.
- Thermocouple protection

Operator control panel allows test set-up and start direct at the testing machine.

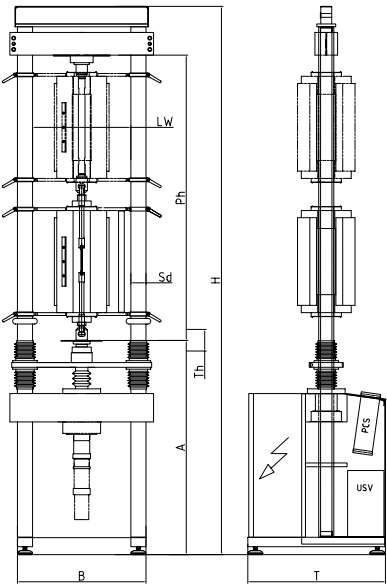
Main Elements

- ID controller with display for upper, middle and lower zone of high temperature furnace
- Main switch with Power On light
- Manual or automatic furnace selection button
- Furnace start bottom (for manual mode)
- Control lamps for Furnace on, -Furnace failure, UPS OK, -Low battery UPS, -Power failure
- Digital close loop controller with digital hand wheel for easy and accurate position or force control for test set-up with emergency bottom
- Protection cover
- With in the base integrated UPS for normal course of trouble free operation in case of power shut down up to 10 minutes. Keeps the electromechanical drive in closed loop control and holds the temperature controllers in operation (current of furnace is not supported but re-starts automatically afterwards).



Specifications

Accuracy	In accordance with ISO 7500-1 and EN 10002-2, Grade 0.5.
Control	Standard: force and displacement closed loop controlled. Option: with extensometer strain closed loop controlled.
Test Speed	Standard: 0.001 mm/min up to 100 mm/min. Depending on application. All others available upon request.
Piston Stroke	Standard: ± 50 mm. Others available upon request.
Power Requirements	3 x 400 V, 50 Hz. Others upon request.



Type LFMZ		10	20	30	50
Max. Test Load Static	kN	10	20	20	50
Max. Test Speed	mm/min	100	100	100	100
Piston Stroke (Th)	mm	± 50	± 50	± 50	± 50
Max. Vertical Test Space (Ph)	mm	1300	1300	1300	1300
Space between Columns (LW)	mm	500	500	500	500
Column Diameter (Sd)	mm	80	80	80	80
Working Height (A)	mm	1100	1100	1100	1100
Width (B)	mm	800	800	800	800
Depth (T)	mm	750	750	750	750
Height (H)	mm	2900	2900	2900	2900
Weight (without Grips)	kg	980	980	980	980
Frame Stiffness	kN/mm	100	100	100	100



Electromechanical Universal Testing Machines

Series LFMZ 100 – 500 kN

Testing machines for tensile, compression and fatigue reverse stress tests in a closed loop control system. Specially designed machines for slow speed static and quasi-dynamic cyclic testing as required for long term creep, relaxation or low cycle fatigue (LCF) tests on a wide variety of materials.

The machines are available in different variations to suit your specific testing needs. The machines are built in rigid two-hard-chromium plated column construction, precision aligned, movable upper crosshead, mounted on the welded machine's base frame. Servo-controlled testing system with high-resolution ball screw driven central actuator with prestressed ball nut and backlash free torsion security device. The central ball screw assembly is fully bedded in oil for minimized abrasion and point-load between balls and

screw guarantee longest trouble free operation even when small movements are controlled over long term testing.

It features AC-brushless servomotor for most accurate control. The test space is configurable to meet specific application requirements. For the Series LFMZ the fully range of high temperature testing equipment is available.

Features

- Servo-controlled testing system with high-resolution ball screw driven ac-

tuator with prestressed ball nut and backlash free torsion security device. Controlled by a high responsive AC servomotor.

- Machine frame in rigid two-hard-chromium plated column construction, precision aligned with movable upper crosshead, mounted on the welded machine base frame.
- Precision flat load cell for accurate force measurement and control fixed on central screw, and incremental displacement transducer for accurate displacement measurement and control.

Application LCF-Testing

Low Cycle Fatigue (LCF) testing typically is a strain-controlled test with a high level of deformation compared to other types of fatigue tests and many times performed under high temperatures.

Depending on application and frequency range the Series LFMZ with its central spindle assembly or otherwise the servohydraulic Series LFV providing optimum results for low cycle fatigue testing. Both systems offers optimized drive (central spindle bedded in oil, or the virtually friction free servo-actuators with hydrostatic bearings) for accurate strain controlled waveform. An important key point is a suitable load frame with both, high axial and lateral stiffness.

High axial stiffness minimizes the stored energy in the load train, which would tend to "unload" into the specimen when it is in a state of high plastic strain, making control difficult. Lateral stiffness is required to prevent the on-set of buckling when the specimen is under high compressive stresses. Even when buckling is not visibly apparent, the on-set of buckling can lead to errors due to the non-uniformity of strains within the gage section.

With this in mind, the Series LFMZ load frame for LCF testing always is supplied with superior axial and lateral stiffness. Another key point for LCF testing is a proper alignment. The alignment fixture which is part of the Series LFMZ for LCF-testing guarantees an upper limit of 5% bending strain. The compliance covers existing standards as ASTM Standards E1012, ISOTC 164 SC 5 WG11 or GE-S 400. Commonly LCF tests are performed on threaded, smooth shank or button head specimens. For all types of specimens we offer suitable grips.



Specifications

- Accuracy

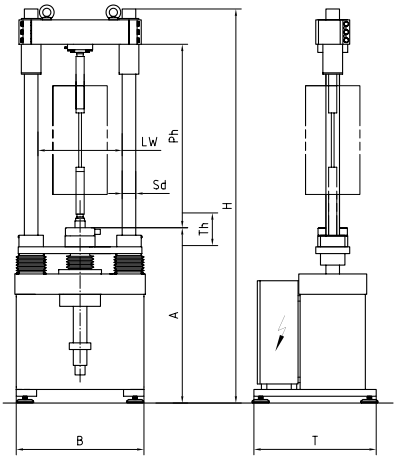
In accordance with ISO 7500-1 and EN 10002-2, Grade 0.5.
- Control

Standard: force and displacement closed loop controlled.
Option: with extensometer strain closed loop controlled.
- Test Speed

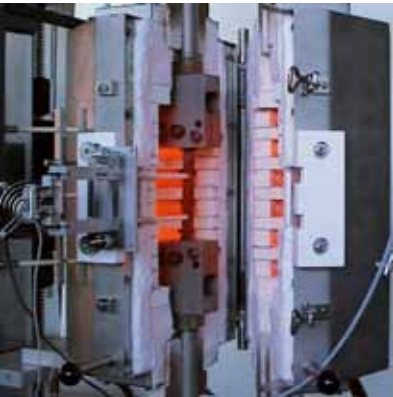
Standard: 0.001 mm/min up to 100 mm/min.
Depending on application. All others available upon request.
- Piston Stroke

Standard: ± 50 mm. Others available upon request.
- Power Requirements

3 x 400 V, 50 Hz. Others upon request.



Type LFMZ		100	250	500
Max. Test Load Static	kN	100	250	500
Max. Test Speed	mm/min	100	100	100
Piston Stroke (Th)	mm	± 50	± 50	± 50
Max. Vertical Test Space (Ph)	mm	1100	1100	1100
Space between Columns (LW)	mm	600	600	600
Column Diameter (Sd)	mm	80	100	120
Working Height (A)	mm	1300	1400	1500
Width (B)	mm	800	900	1000
Depth (T)	mm	900	950	1000
Height (H)	mm	2900	3000	3100
Weight (without Grips)	kg	1200	1400	1700
Frame Stiffness	kN/mm	200	500	1000



Custom Designed Electromechanical Universal Testing Machines

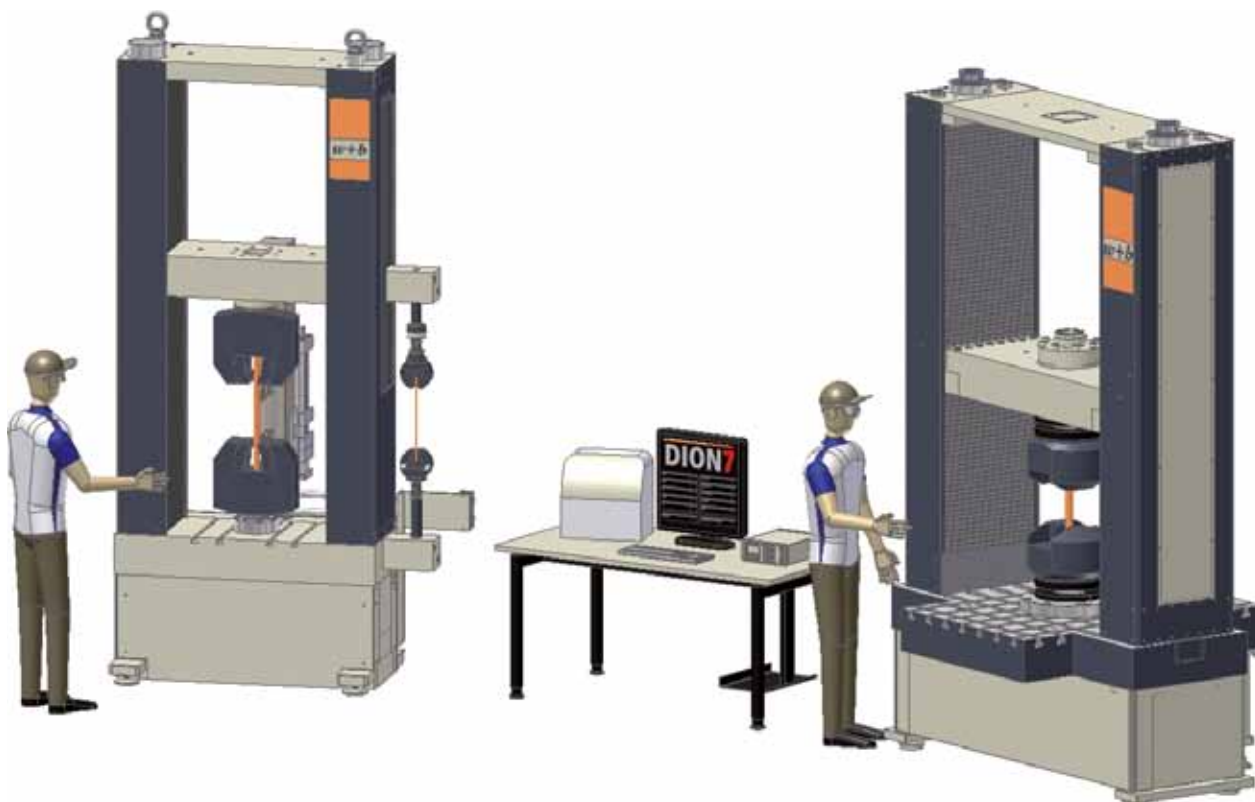
Specific testing tasks demand appropriate testing equipment! This is our motto. Therefore, beside of our standard range of electromechanical testing machines, we have developed a wide range of individual solutions for static and dynamic material and component testing.

w+b can design a custom solution or provide a standard machine to meet your needs! We can custom design the modular constructed electromechanical universal testing machines Series LFM according to your needs and your testing applications.

Beside that we have a comprehensive range of accessories such as grips, fixtures, extensometers, products for simulation of environmental

conditions or different software packages.

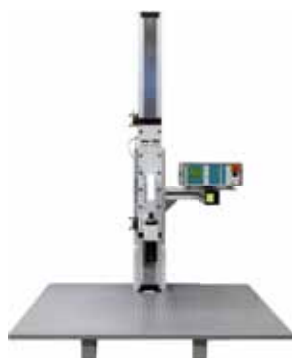
This includes adjustment of the test speed, resolution of the system, extension of the testing chamber for high temperature furnaces or climatic chambers, we provide additional load cells, mounting plates with t-slots or additional holes/threads, 2nd and 3rd testing chambers or stations, horizontal executions and much more.



Applications Series LFM – L 1 – 20 kN

**Series LFM – L
with Large Base
Platen**

Designed for testing specimens with large dimensions such as mattresses, foam blocks, packages or car seats a.s.o. The machine is an ergonomically designed table top model with a large working area. The working table is open to three sides. Base platen is available with holes, threads or T-slots to fix components, specimens or manufactured assemblies.

**Series LFM – L
with Horizontal
Test Space**

The universal material testing machine Series LFM - L in horizontal execution is specially designed for testing of extra long specimens. Available to fit many horizontal testing applications to accommodate extra long test specimens as cables, wires, ropes a.s.o. The Modular test system is available with a wide range of different grips and fixtures for a wide range of testing applications.

**Series LFM – L
with T-Slots
Base Platen**

The universal material testing machine Series LFM - L with the T-slots base platen is specially designed for easy and accurate fixing components and fixtures. For universal testing of components and for easy fixing of various testing devices for tensile, compression and bending testing.

**Series LFM – L for Testing of Construction
Elements consisting of Shape Memory Alloys**

Developed to determine the phase change temperatures of Shape Memory Alloys - SMA varying accordingly to the parameters elongation, load (stress) and temperatures. The specific material behaviour of untrained or trained shape memory elements under real operating conditions can be tested.

**Series LFM – L
with Thermostat Bath
and Circulation Hoses**

The universal material testing machine with a thermostat bath with the circulation hoses is specially designed to keep the sample fixture devices at constant temperature of 37°C. Specially designed for testing of dental and orthopaedic implants for quality assurance and according to international relevant standards.

**Series LFM – L
with Additional
Rotating Drive Unit**

The universal material testing machine is equipped with a rotating drive unit on the crosshead and is therefore specially designed for tension- or compression-torque tests and drilling tests on implant materials as bones. The machine can also be used for testing or implant inserting tools.

**Series LFM – L
for Testing of Textiles
and Geotextiles**

Tensile tests on geotextiles and synthetic textiles according to EN ISO 10319. Optional with high elongation extensometer or non-contacting video extensometer for accurate determination of the strain. Different grips are available with different jaws depending on the surface of the specimen.

**Series LFM – L
for Compression
Tests on Packages**

The universal material testing machine Series LFM - L is equipped with compression platens to determine the stacking characteristics or the inherent rigidity of packages for the process of packing and according to international relevant standards.



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Applications Series LFM 20 - 125 kN



Series LFM for High Temperature Testing

For testing materials used in aircraft turbines, rocket propulsion, hot outer skin structures, as materials for exhaust systems, composites or ceramics. Machine is configured with high temperature furnace, pull rods and compression rods. Furnace can slide out of testing room for universal material testing.



Series LFM for Testing of Wood and Timber

Available are different fixtures such as compression, bending, indentation hardness, shear, screw pull-out, tensile adhesion and cleavage fixtures according to ASTM, BS and other relevant international standards to fix into Series LFM universal material testing machines.



Series LFM for Textile and Geotextile Testing

This universal material testing machine Series LFM is configured with pneumatic wedge action grips and digital video extensometer. Specially designed for tensile tests on geotextiles and synthetic textiles according to EN ISO 10319 and other relevant international standards.



Series LFM with T-Slots Base Platen

The testing machines with the T-slots in the base platen allows an universal fixing of components, assemblies and finished goods into the testing chamber. Also for easy fixing of various testing devices for tensile, compression and bending testing.



Series LFM with 2 Testing Rooms

For testing of higher strength materials in the lower testing room 100 kN and lower strength materials in the upper testing room 10 kN in one testing machine. This helps to reduce the time considerably for changing grips and fixtures as well as load cells for different material strengths.



Series LFM for Testing of Shoulder or Threaded End Holders

Specially designed with self-aligning tension grips for testing according to DIN 50125 B and C and ASTM E8, A370 and A48. The grips feature a superior alignment due the construction with spherical seated inserts (holders). This minimizes the bending strain.



Series LFM for High Temperature Tensile Tests

Configured with high temperature pull rods and three-zone furnace up to 1200°C. The furnace is mounted on a bracket to swing it easily out of the testing chamber for universal testing. The furnace is equipped with an axial high temperature extensometer Series 3548 with high purity alumina rods.



Series LFM for R-Value Determination of Fine Sheet Metal

The machine is equipped with Series MFQ - A transversal extensometer for the automatic determination of the R-value (vertical anisotropy). Equipped with two measuring clamps to form the average value of two separate measuring locations.

**Type LFM 100
with Extended
Test Space**

This machine has an extended test space of total 2000 mm for testing of high elongation or extra long textiles and geotextile samples with max. width of 200 mm under room temperature and high / low temperatures. The machine is equipped with environmental chamber for simulation of temperatures from -70°C up to +280°C.

**Type LFM 100
with Extra Long
T-Slot Base Platen**

This machine is equipped with an extra long T-slot base platen, which allows to fix different samples. The LFM is especially configured for tensile, pull-out, bending, compression and shear tests on prefabricated heat insulation elements for wall constructions. Additionally the load string can be adjusted to the left or right.

**Type LFM 100
for Efficient High
Temperature Testing**

This machine is equipped with two swing-out furnaces. While preheating one furnace with the loadstring and the sample, the other furnace is moved into the testing chamber and the test takes place. With this solution very little time is lost for changing samples and preheating time.

**Type LFM 50
4 Machines for Steel
Testing in Series**

This steel testing laboratory is equipped with four testing machines Type LFM 50 kN. This allows the execute tensile tests on steel and aluminium samples in series for an efficient work flow. One machine is configured with an automatic extensometer for additional exact strain measurements.



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Applications Series LFM – H 150 - 600 kN



Series LFM – H with Mounting Plate

This execution allows beside of conventional tension, compression or flexural testing also to perform tests on components or finished goods as drive systems, chassis or bodywork for the automotive industries. For this the lower grip can be removed easily out of the testing machine, so that the specimen can be fixed with stud for tongues for T-slots or additional holes or threads. The increased horizontal daylight ensures an easy accessibility.



Series LFM – H with 2nd & 3rd Test Area 600 kN / 100 kN / 10 kN

Additional test stations are added on the right and left hand side. They are ideal for applications where high and low strength materials (from metal, building materials to rubber) must be tested. Each testing station is equipped with the correct load cell providing most accurate testing with the suitable grip or fixture.



Series LFM – H with 2nd Test Area 250 kN / 20 kN

The testing machine Type LFM 250 kN is equipped on the right hand side with a 2nd test station for tests up to 20 kN with the appropriate load cell. These solutions with additional test stations provides a high degree of flexibility and productivity within one machine and is more cost effective than running several machines..



Series LFM – H with T-Slots Base Platen

The testing machine is equipped with T-slots on the base platen and compression platens. This allows to perform various compression tests on components, assemblies and finished goods. The machine is equipped with safety sensors around the testing chamber for protection of the operator.



Series LFM – H for High Temperature Testing

The Series LFM - H is specially designed for testing of sheet metals under ambient and high temperatures as a research project for the automotive industries. The machine is equipped with high temperature furnace Series STE up to 1300°C and extensometer Series HTV with motorized stylus approach and automatic stopping after contact with the specimen.



Series LFM – H with Additional Torsional Drive

The universal testing machine is equipped with electromechanical driven torsional drive on the crosshead and load cell for axial and torsional forces. Also equipped with axial-torsional extensometer Series 3550. Specially designed for static tension-torsion and compression-torsion tests on different sample for research purposes.



Series LFM – H for Testing of Concrete Rebars

The testing machine is specially designed for testing of high strength concrete rebars up to 600 kN. The machine is configured with hydraulic parallel wedge grips Series SPG with two-piston clamping for accurate and repeatable test results. The strain is measured with the clip-on axial extensometer Type MFA 20 for heavy duty applications.



Series LFM – H for Research on Steel

The machine is configured with hydraulic grips Series WGR - H, fully automatic extensometer Series MFL and high precision load cell. These accessories together with the testing machine allow a very accurate execution of the test from clamping of specimen to precise measurement of the strain and of the applied force.

**Type LFM – H 300 kN
for High Temperature
Steel Testing**

This LFM - H is specially designed for testing of steel under ambient and high temperature. The machine is equipped with hydraulic parallel grips Type SPG 300 kN for testing under room temperature. For high temperature tests, the furnace Type STE 19 up to 1100°C and extensometer Type HTV are swung into the testing chamber.

**Type LFM – H 200 kN
for High Accurate
Strain Determination**

This LFM - H 200 kN is specially equipped with digital video-extensometer Series VEX and back-light for very precise strain measurement on concrete rebars. The hydraulic wedge grips Type WGR 200 kN allow an accurate clamping of the specimens for repeatable tests and accurate test results.

**Type LFM – H 250 kN
for Universal High
Strength Steel Testing**

This LFM - H 250 kN is specially designed for tensile and bending tests on high force steel. The machine is equipped with manual operated wedge grips Type WG 250 kN. Therefore the system does not need any hydraulic oil and is maintenance free. Additionally equipped with bending testing device Type BT 250 kN.

**Type LFM – H 500 kN
for Compression Tests
on Steel Samples**

The testing machine is especially designed for compression tests on steel samples under ambient temperature. The machine is equipped with a special compression device for forces up to 500 kN and protection device around the device for safe test execution while still having convenient access to the testing chamber.



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Applications Series LFMZ 25 - 500 kN



Type LFMZ 500 kN for Calibration of Force Sensors

Equipped with compression plate with central threads enabling to place and fix a wide number of different compression or tension load cell. The software allows to check the sensors by performing one single continuous ramp with signal input of the sensor that has to be verified and online error calculation.



Type LFMZ 50 kN for Testing and Research on Asphalt

With environmental chamber for uniaxial testing and research on asphalt mixes to determine resilient modulus, Poisson's ratio, indirect tensile creep and strength, tensile strength, phase angle, and flexure fatigue. Further tri-axial asphalt, soil resilient modulus, liquefaction, and conventional UU, CU, and CD soil tests are performed.



Type LFMZ 400 kN for Testing of Wire Strand Samples

The central spindle electromechanical testing machine is configured for very slow relaxation, creep and LCF tests with test loads up to 400 kN. The machine is equipped with the modular wire strands grips Series WSG to accept different wedges for wire strands.



Type LFMZ 50 kN for LCF - Testing

Low Cycle Fatigue testing is a strain-controlled test with a high level of deformation compared to other types of fatigue tests and performed under high temperatures. The testing machine is equipped with alignment fixture Series AF, high temperature grips Series HTG, high temperature furnace Series STE up to 1200°C and extensometer Type 3648.

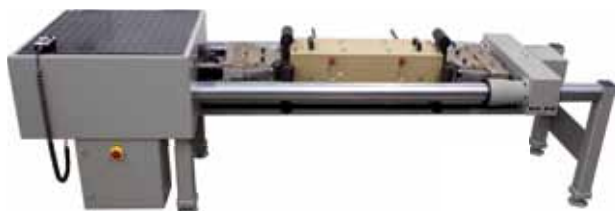


Type LFMZ 50 kN for TMF - Testing

The machine is equipped with alignment fixture Series AF, dynamic collet grips Series HCG, induction heating system Series IHS up to 1000°C with thermocouples, air cooling of grips and sample, capacitive extensometer type 3648. The machine is controlled by the 2-channel control system Type PCS8000T2 with application software DION TMF. For more details refer to Application TMF in Section E - Dynamic.

Type LFMZ 400 kN – H in Horizontal Execution for Research on Young Concrete

This horizontal machine is equipped with heated tension/compression grips specially designed for concrete samples with conical ends. Additionally with temperature controlled form work from -10°C up to +80°C.



Applications Series LFM - C

Type LFM - C 50 kN for Testing of Floor Platens

This LFM-C 50 kN features an extra large base platen with integrated T-slots. The machine is especially designed with the 4-point support for bending tests on floor platens for access floors in offices. Additionally the machine can be equipped with tensile grips for adhesion tests on the carpet of the floor platens.



Type LFM - C 50 kN for Various Low Force Tests

This LFM -C is equipped with compression platens for the determination of the compressive strength of various different samples. The test chamber height allows to fix various different grips and fixtures for any application in the force range up to 50 kN. Please refer to Section P - Grips and Fixtures for a large selection of low force grips.



Type LFM - C 25 kN for Very Slow Tests

The testing machine is specially configured for very slow tests with test speeds as low as 0.000006 up to 0.6 mm/min.. The machine is equipped with threaded grips Series 189 for tensile tests on threaded round samples.



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Electro-Thrust

Electric Cylinders

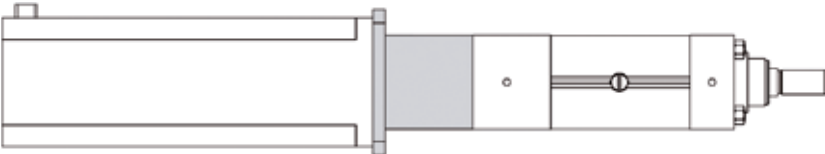
Series EC 0.5 – 50 kN

The electro-thrust electric cylinders offer an alternative to hydraulic systems for static and cyclic material and component testing. This family contains 5 different cylinders with thrust forces 0.5 kN up to 50 kN.

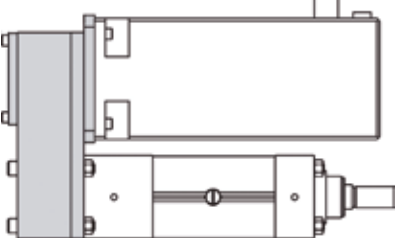
The cylinder assembly incorporates a high quality class ball screw drive that allows very short movements due to the absence of stick-slip effects and speed up to 750 mm / second depending on unit and gear box. The cylinders are available with inline mounted drive

providing high responsive control with minimum backlash or with parallel mounted drive whichever is more suitable for your testing needs.

Inline Mounting of Motor



Parallel Mounting of Motor



Specifications

Accuracy	In accordance with ISO 7500-1 and EN 10002-2, Grade 0.5.		
Control	Standard:	force and displacement closed loop controlled.	
	Option:	with extensometer strain closed loop controlled.	
Test Speed	Standard:	0.001 mm/min up to 750 mm/min.	
	Depending on application. All others available upon request.		
Power Requirements	230 V, 50 Hz. Others upon request.		

Subject to change without notice.

Type EC		0.5	2.5	7.5	20	50
Max. Test Load Static	kN	0.5	2.5	7.5	20	50
Max. Test Speed	mm/min	750	750	750	750	750
Piston Stroke	mm	50-750	50-1000	100-1500	100-1500	100-2000
System Backlash ¹	mm	0.02	0.02	0.02	0.02	0.075

¹ (with inline motor mounting only)

