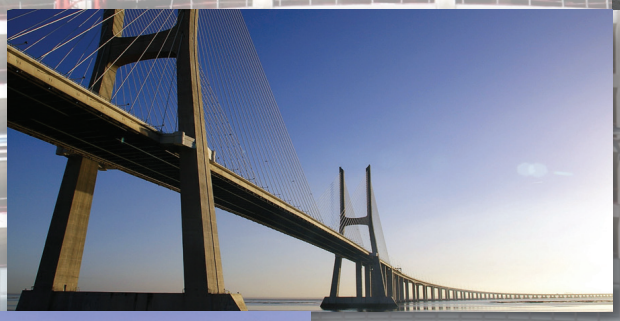
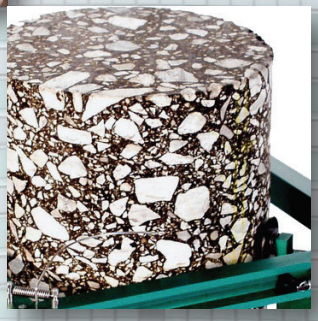
walter+bai

w+b

Temperature Stress Testing Machines





Welcome by

walter+bai

Dear Customer

Mechanical testing plays a major role in research and education, product development, design and quality control. In this Overview Prospect we present the summary of our solutions for static & dynamic testing on materials and components which are globally employed by engineers and scientists to achieve the best results.

By selecting our equipment you benefit from our extensive experience in development and production of materials testing systems to suit numerous applications.

Should you require a very specific and customized testing system, we are able to design, develop and produce such system for you. We deliver customized solutions and complete installations for physical and mechanical testing laboratories world-wide.

Our prior goal is to supply advanced and up-to-date testing equipment designed for standard and severe conditions, coupled with long-lasting and reliable operation. To ensure that you obtain the maximum rewards from your investment, our accredited calibration laboratory guaranties an excellent after-sale service and verification facilities are awlays available for your installation. Our worldwide network of experienced representatives and qualified engineers provide you with optimum after sale support so that you thoroughly benefit from your testing system.

Please do not hesitate to inform us how we can make this catalogue better for you in the future. Your feedback and suggestions will be gladly received on info@walterbai.com.

Sincerely yours,

Ralph Walter
Managing Director, walter+bai ag

walter+bai ag Testing Machines supplies a wide range of material testing machines and systems for the safety and quality of materials, industrial products and buildings.

Mechanical testing is carried out in many industrial sectors, such as the automotive and aircraft industry, metal industry, plastic and rubber industry, the chemical industry, construction industry, bio mechanics as well as at institutes and universities. Serving these sectors for more than 45 years, w+b customers benefit from the company's extensive experience in producing material testing systems and equipment to meet this wide range of applications. Due to our comprehensive know-how and considerable engineering capabilities we are able to offer not only standard testing machines but also customized solutions or complete installations for physical testing laboratories world-wide. To ensure you obtain the maximum rewards from your investment, our accredited calibration laboratory guaranties that excellent verification facilities and after-sale service are available for your testing equipment.

Profile

We are renowned for the production of high quality systems. Due to our continuous research and development policy as well as actively collaborating with our customers and suppliers we have always maintained the very high product standard ever since the company was founded in 1970 by Armin Walter and Alfred Bai in Löhningen - Switzerland. The sales, design and manufacturing divisions associated with testing machines has grown due to the constant interaction with a multitude of clients and the systematic realisation of their requirements. Our product range has been steadily expanded and our service sector activities extended to meet growing demands. The unique position of w+b in the field of material testing machines can be attributed to the fact that their specialised know-how related to materials testing is being constantly updated whilst offering custom designed products and services. A well qualified and highly motivated staff coupled with an efficient organisational structure forms the backbone of w+b upon which you can rely for know-how, competence and reliable performance.

«Specific testing tasks demand appropriate testing equipment!»

This is our motto. Therefore, besides our standard range of testing machines, we have developed an extensive number of customized testing machines for static and dynamic material and component testing.

w+b Testing Machines are the pacemaker for trendsetting technologies. They are a prerequisite for the safety and quality of materials, industrial products and buildings.

Our Products and Services

- Manufacturing of materials testing machines and systems
- Customer specific testing systems
- Servohydraulic and electromechanical, static and dynamic testing machines
- Digital measuring and control systems and testing software
- Hydraulic power packs
- Static and dynamic actuator testing systems
- Accesories and fixtures for component testing
- Testing machines for construction materials
- Modernisation of existing testing machines
- Maintenance and calibration of material testing machines
- Project management and technical consulting

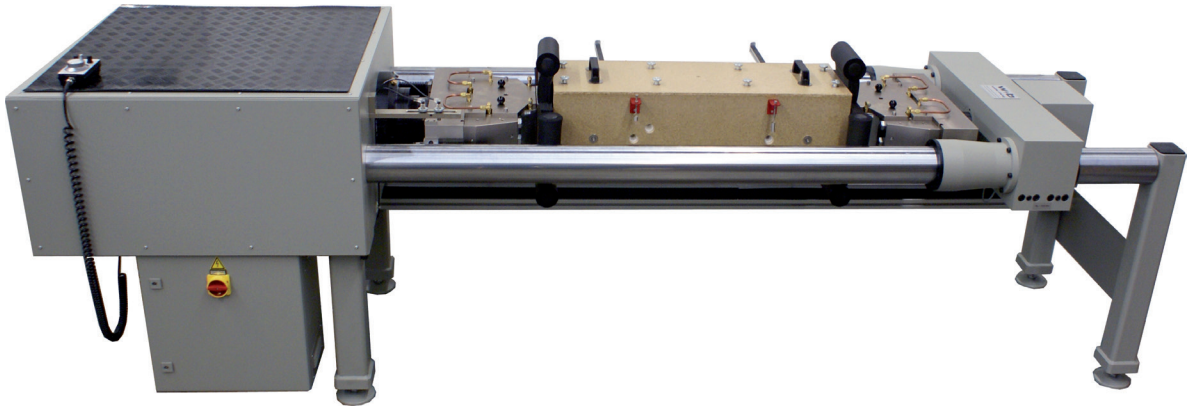
SCS 0068 ISO 9001

Temperature Stress Testing Machine (TSTM) For Studies on Early-Age Behaviour of Concretes and Fibre Reinforced Concretes

Type LFMZ - H up to 400 kN

TSTM Test Systems are used, along with suitable accessories, to investigate early age mechanical behaviour, monitoring of stiffness, creep or the relaxation of concrete sample from setting time, to investigate the reinforcement on early-age concrete, temperature stress or for experimental study on early-age crack of concrete under a controlled temperature history.

The system allows tests on concrete in tension or in compression direction from setting time under free and restraint conditions to investigate the response at an early age.
Among others the Young's modulus, the creep or the relaxation with active compensation of shrinkage, total restraint, in single or incremental loading histories or cyclic loading applied at regular intervals in tension or in compression of the sample can be monitored at early age at the end of the setting time. The setting time can be determined for example with a so called FreshCon device allowing the determination of the setting time on basis of ultrasonic measurements.
The Testing Machine allows to be controlled in displacement / deformation or in force control.

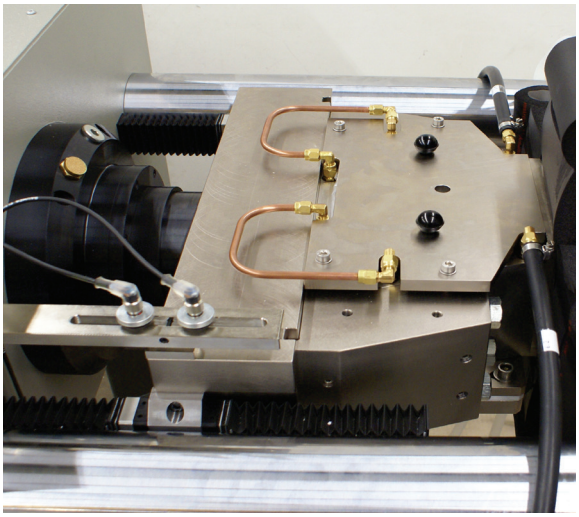


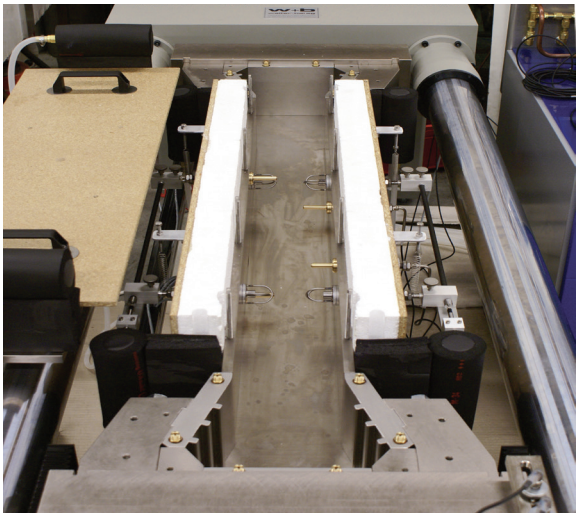
Temperature Control System

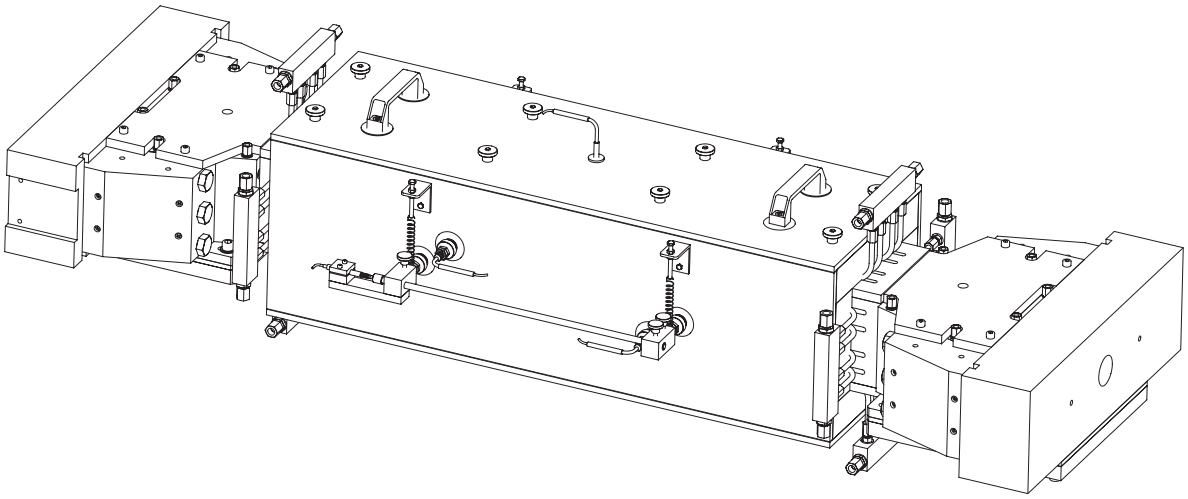
A temperature control system with temperature sensors (thermocouples) allows monitoring of sample's temperature for data acquisition.

Isolated and Temperature controlled Form

A well isolated Temperature Controlled Form Work is supplied for the selected sample sizes. Feedthroughs are provided for temperature sensors and deformation system. Additionally the gripping part can be isolated and tempered.

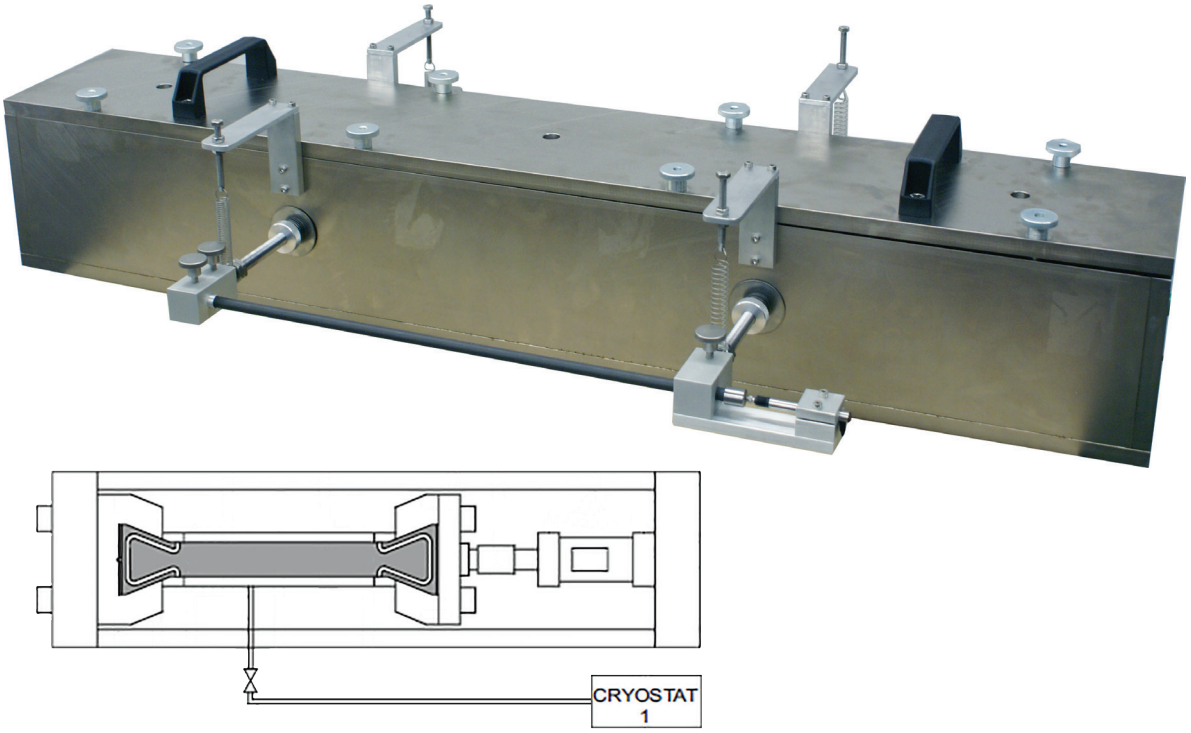


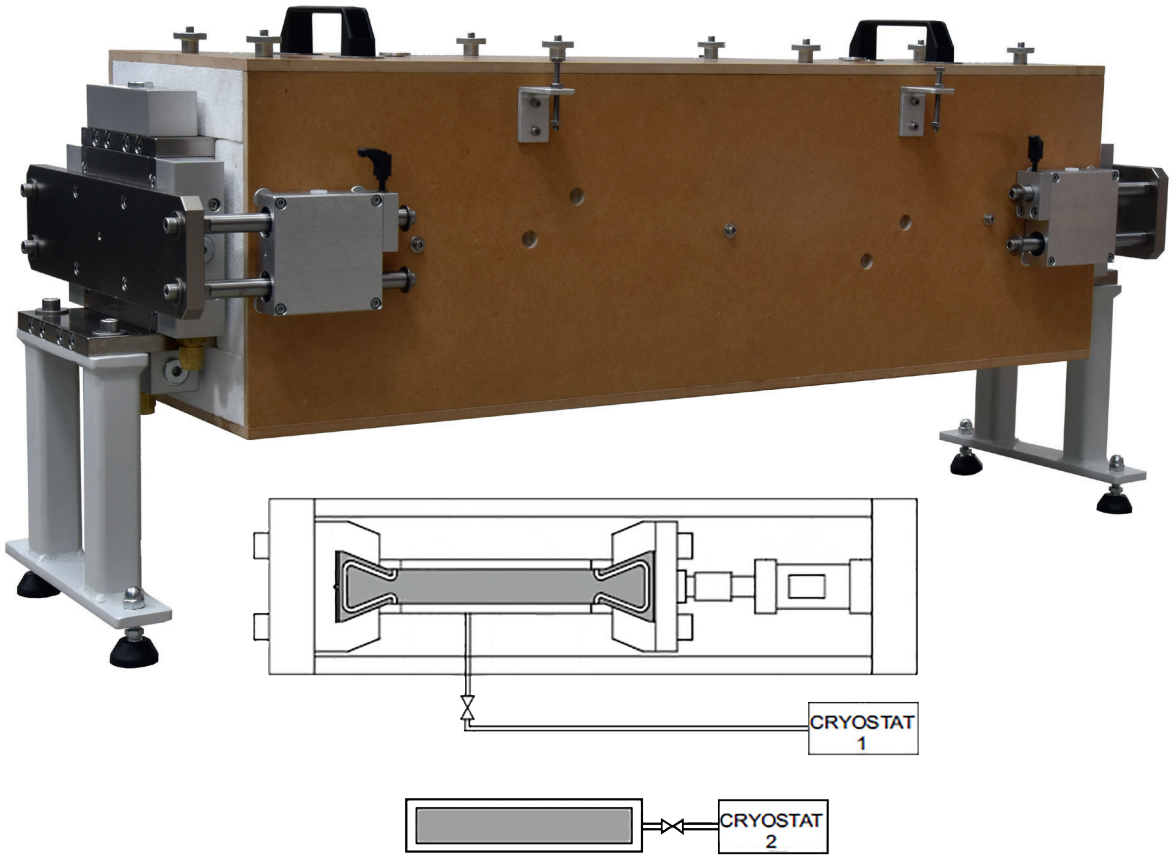




Accounting for Thermal and Shrinkage Deformations

If thermal and shrinkage deformations need to be known, a dummy mould can be used for the measurement of these deformations.



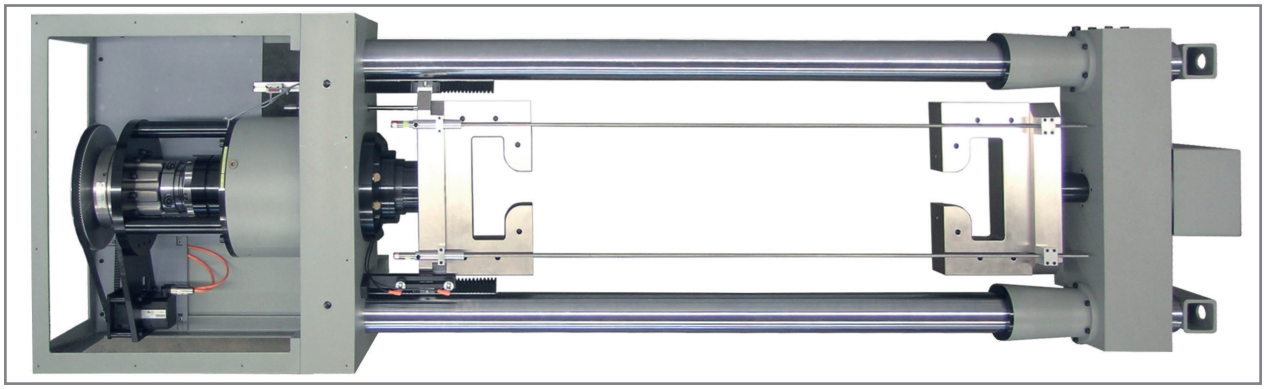


Measuring Displacement and / or Deformation right from Setting Time due to suitable Sensors

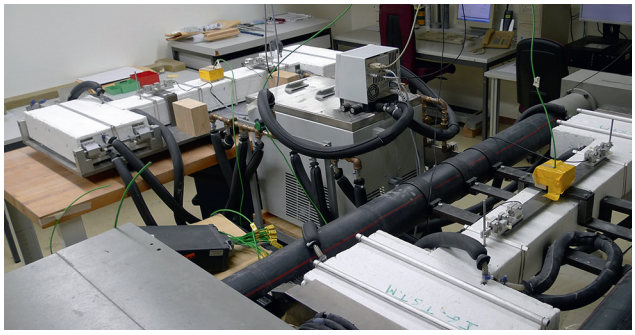
Examples of used systems for deformation measurement:

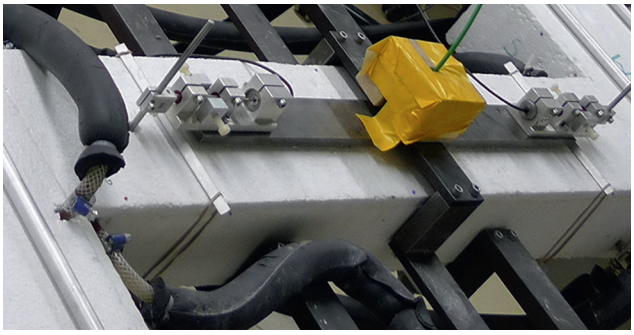
- Foucault Current's contact free sensors.
- LVDT displacement transducers
- Laser displacement sensors
- Mold Strain / Vibrating Wire Stain Gauges
- Fiber Bragg Gratings

Sample deformation measuring system through measuring grip-to-grip separation with two LVDT transducer and Invar rods.

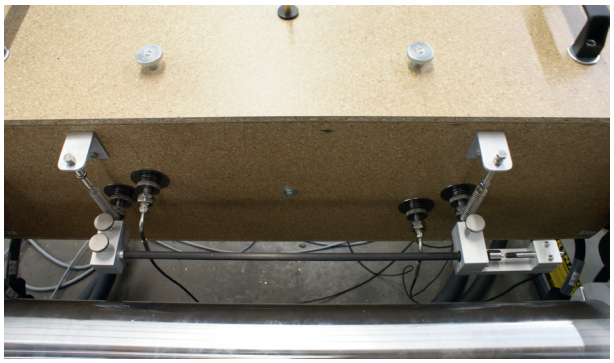


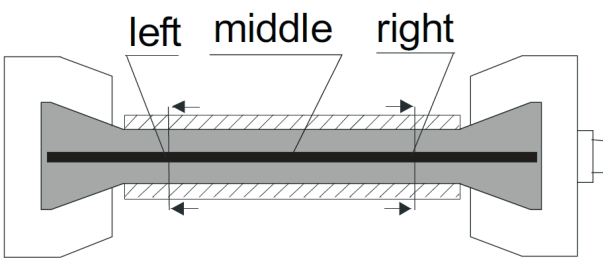
Sample deformation measuring system with two LVDT transducers mounted on top of the specimen





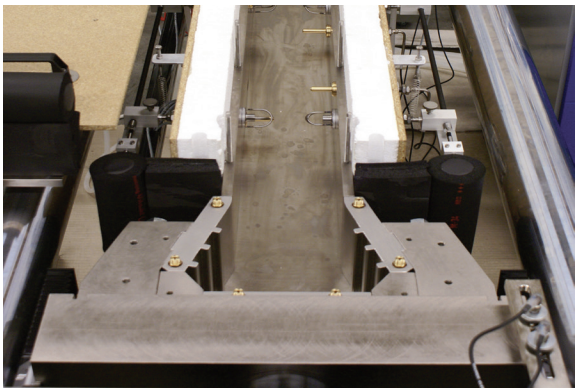
Averaging Sample deformation measuring system on opposite sides with two LVDT transducers mounted on side



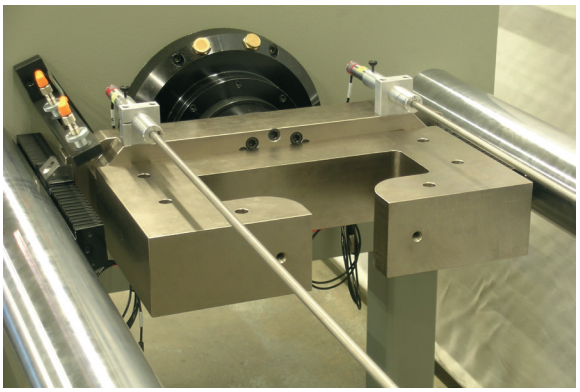


Commonly used Sample Shapes

Typically used sample types are (but are not limited to) Dog-Bone samples with wedge ends or curvature with cross-section 100x100 mm^2, 100x150 mm^2 or 150x150 mm^2 with straight lengths of 750 to 1500 mm.



Grips for Wedge-End Dog-Bone Samples



Grips for curved Dog-Bone Samples (Relaxation Test)

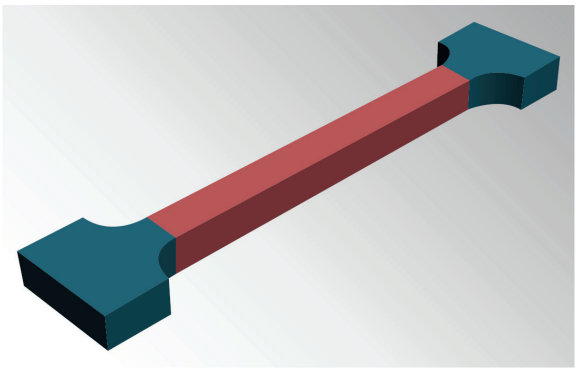


Illustration of a curved Dog-Bone Sample

Control and Data-Acquisition

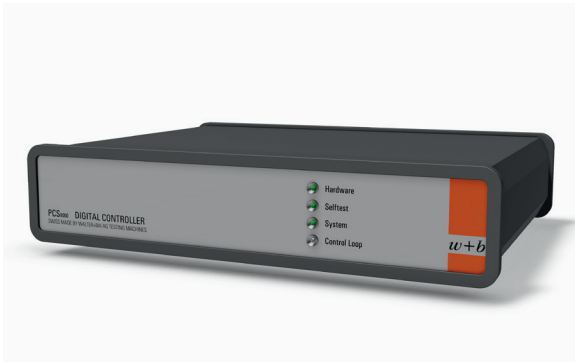
Control and Data-Acquisition is achieved through Ultra-High-Speed & High Resolution Digital Controller PCS8000 and DION7 Application Software.

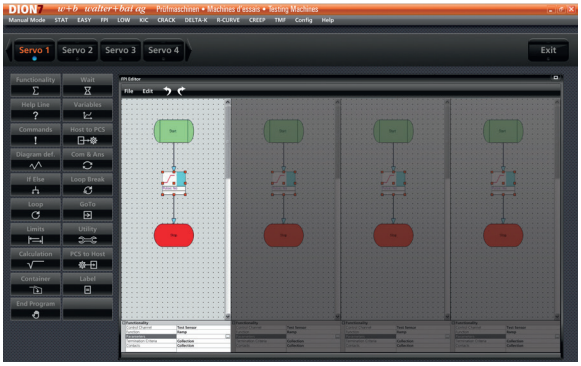
This modular & versatile fully digital controller represents the latest generation of ultra-high-speed & high-resolution controllers, adapted for the full spectrum of applications ranging from materials and component tests to complex multi-axis (multi-channel) simulation.

The PCS8000 is able to control everything from monotonic electromechanical testing machines to electrodynamic or servohydraulic systems, single channel actuators to multi-channel test stands.

Tests can be programmed in bloc-programming with data-acquistion in many flexible ways.

The system allows to connect force, displacement, deformation, temperature and other sensors.



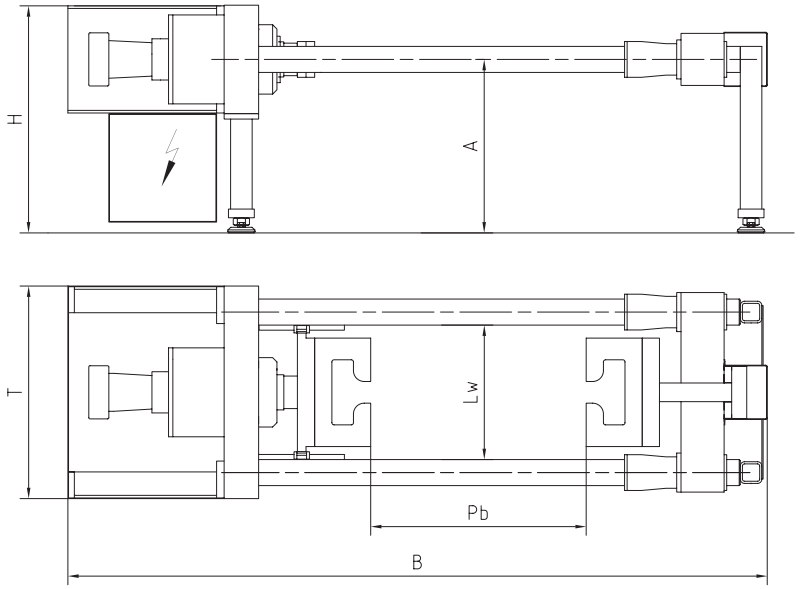


Entsprechend den zu erfüllenden Anwendungen sind die EC Prüfzylinder mit Kugelumlaufspindeln oder mit Planetenrollenspindeln lieferbar. Die Ausführung mit Kugelumlaufspindeln eignen sich für lange Prüfhübe. Für kurz- und langhübige Versuchdurchführungen sind die Elektrozylinder mit Planetenrollenspindeln die richtige Wahl.

Specifications

Force Capacities	Compression / Tension: 400 kN / 100 kN
Accuracy	In accordance with ISO 7500-1, Grade 0.5.
Colour	Light Grey RAL 7035. Others upon request.
Power Requirements	3 x 400 V, 50 Hz. Others upon request.

Technical Data Type LFMZ		100	200	400
Compression Capacity	kN	100	200	400
Tension Capacity	kN	100	100	100
Piston Stroke	mm	100	100	100
Test Speed	mm/min.	0 - 20	0 - 20	0 - 20
Max. Distance betw. Grips (Pb)	mm	1300	1500	1500
Distance betw. Columns (Lw)	mm	500	620	620
Frame Width (B)	mm	1950	3050	3250
Frame Depth (T)	mm	900	980	980
Frame Height (H)	mm	1200	1050	1050
Working Height (A)	mm	600	800	800
Weight	kg	1700	2180	2300
Load Frame Stiffness	kN/mm	200	650	1000



Our References

Capacity	Ordered	Customer	Destination
100 kN	x 3	Technische Universität Braunschweig (10564)	DE-Braunschweig
400 kN	x 1	Universität Gesamthochschule Essen (7184)	DE-Essen
400 kN	x 1	VDZ – Verein Deutscher Zementwerke (3518)	DE-Düsseldorf
400 kN	x 1	EPFL – Ecole Polytéchnique Fédérale de Lausanne (13158)	CH-Lausanne
400 kN	x 1	ULB – Université Libre de Bruxelles (14781)	BE-Bruxelles
400 kN	x 1	Changjiang River Scientific Research Institute (17080)	CN-Wuhan
400 kN	x 1	Jiangsu Bote New Materials Co., Ltd (20856)	CN-Jiangsu Province
400 kN	x 1	Hohai University ((25186)	CN-Nanjing

After Sales Service

The world-wide network of w+b highly qualified factory trained support stuff provides customers with comprehensive after sales solutions for *w+b* testing systems.

We are focused on the individual customer support and the offered services include on-site installations, repairs and maintenance throughout the entire life cycle of your testing equipment. Customers of *w+b* know they can benefit a maximum from the acquired testing equipment, and with provided after sales service they are in good hands – now and in the future.

Over 45 Years of Experience

- Customers prefer w+b becauseof our individual customer approach coupled with flexibility and versatility in developing the most customized and specific testing systems.
- However there is more. By choosing a testing system from w+b you start a long-term partnership with us.
- With our world-wide network of w+b highly qualified support and maintenance engineers provides you with an optimum after sales support, to make sure you get the most from your investment.
- w+b constantly invests in hiring and training service engineers and local representatives.
- w+b provides customers with comprehensive free of charge telephone support of all specialists for the lifetime of the product.
- Our large stock of spare parts from the most w+b equipment helps you to minimize the idle time in case of problems with equipment.
- w+b test systems are designed forstable and long term operation. With the provided constant comprehensive service and support you will profit the maximumfrom your ystems throughout their entire life cycle.

Instruction Manual

At w+b a comprehensive customer support starts with a detailed instruction manual. To each system we deliver a complete technical manual including information about safety, system installation, machine setup, technical drawings of testing system, hydraulic and electric schemes with items list, software and hardware manuals, maintenance information, a.s.o. By providing from very beginning this technical information to our clients, which is later on demand complemented by telephone support, enables us to have practically more than 90% of all shut-downs solved instantly.

Installation and Warranty

Our qualified field service engineers are available in short terms to install and to commission your testing system on site after its delivery. All our field service engineers are factory trained and complete the installation in a timely manner.Our service guarantees the reliable commission and operation of your testing system according to the technical specification. All w+b products are covered by a factory warranty.

Customer Training

It is essential that our clients use w+b testing systems to its full extent, i.e. by employing all possible features and capabilities of the acquired equipment. Additionally, as a well-known fact the comprehensive knowledge of machine operation practically reduces the instrumental setup times, also prevents possible mistakes and in turn increases your testing efficiency. Therefore, the technical instruction and extensive operation training are provided by w+b engineer at the time of system's commissioning. Further repetitive training, organized either on site or at w+b premises, ensures that new system's operators from customer side are properly instructed on the operation capabilities of the installed system, likewise the skills of already trained operators are refreshed and retained. We provide an extensive range of comprehensive training courses focused on complete machine operation, software usage, sample alignment, all types of materials tests, and many others. These courses can be scheduled with a short notice and given either at w+b or at your premises.

Hardware & Software Support

To ensure that the acquired system can be steadily employed even though your testing requirements are changing with the time, our software and hardware engineers, including w+b local representatives, will assist you with these tasks, as well as you will receive the detailed information on w+b continuous development of software and hardware. This will guarantee that your system is maintained at peak performance. Through planned and systematic service visits of our engineers for preventive maintenance and calibration of your testing system, any potential problems can be identified beforehand and resolved immediately avoiding unnecessary machine's idle time.

Calibration

w+b calibration laboratory is accredited according to the latest ISO EN IEC 17025 (formerly EN 45001) standard. The calibration and verification of your materials testing machine is a part of our provided service. Our field service engineers are not only trained to perform maintenance and calibration service on w+b machines, also the testing machines of other producers are successfully verified and calibrated in a daily manner. The calibration certificate will prove the verification of your system conforming to ISO 9001 and other standards.

Application Service

We consult customers concerning testing techniques and provide with necessary tools, as well as we create report templates or graphic presentations precisely suited to your specification, developed based on w+b standard software packages. Our application experts have many years of experience in development of materials testing applications and will create a product to fully meet your requirements.

Maintenance and Calibration of Materials Testing Systems

by *w+b* Accredited Calibration Laboratory

The maintenance and service works on your materials testing equipment is executed by our specialists with highest attention and precision, and with experience of over 45 years. Highly precise computer-aided calibration equipment guarantees a calibration according to the latest international standards.

SWISS ACCREDITATION sas.admin.ch SCS 0068

SCS 0068

Our calibration laboratory is certified according to ISO/IEC 17025 which is recognized through the Multilateral Agreement (MLA) for EA - European Cooperation for Accreditation. The maintenance and calibration performed by our specialists with 45 years of experience assure a reliable execution of the service. Your savings: there are no extra costs for an additional calibration by a further official calibration institute, since we are an accredited calibration laboratory.
We will calibrate your test equipment independently of the type and manufacturer. We offer excellent conditions together with flexible dates. The accreditation according to ISO/IEC 17025 is recognized through all signatories of the EA (European Cooperation for Accreditation) multilateral agreement of calibration.

w+b Calibration Laboratory is accredited for:

- Force - Tension, Compression
- Pressure
- Length - Displacement, Deformation
- Hardness
- Energy - Impact Tester

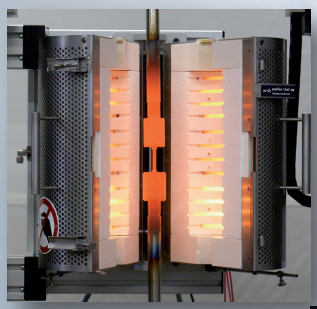
walter+bai

walter + bai ag
Testing Machines

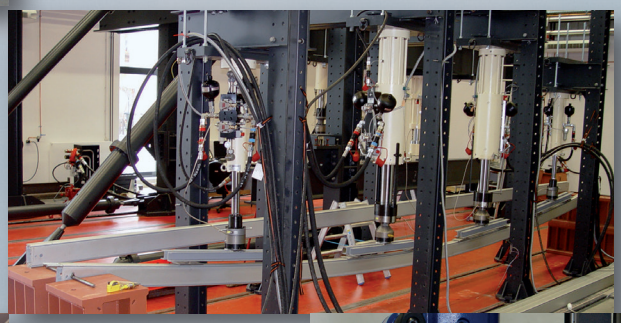
Industriestrasse 4
8224 Löhningen · Switzerland

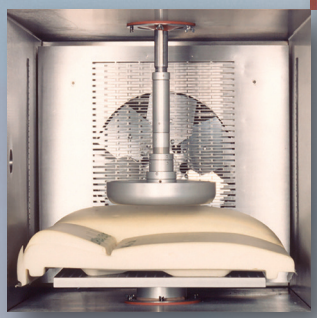
Tel. +41 (0)52 687 25 25
Fax +41 (0)52 687 25 20

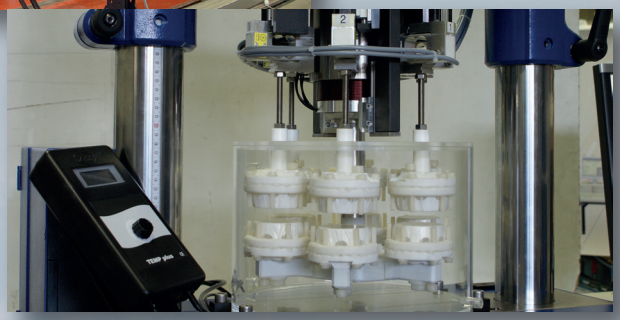
info@walterbai.com · www.walterbai.com

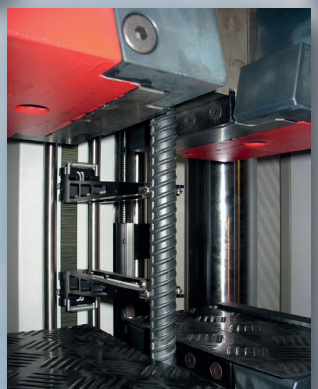


- Static Universal Testing Machines, Electromechanically or Servohydraulically driven
- Dynamic Multipurpose Testing Systems for Advanced Material and Component Testing
- Torsion, Rotary Bending, Impact Pendulum Testing Machines
- Hydrostatic Pressure Testing Systems
- Customer Specific Testing Machines, Modernisation of Existing Testing Machines









- Accessories for Material Testing, incl. Digital Controllers, Application Software, Hydraulic Power Supply, Grips and Fixtures, Extensometers, Furnaces and Climatic Chambers, a.s.o.
- After-Sale Service at Customers Laboratory
- Calibration of Material Testing Machines