

walter+bai 1000kN Electromechanical Universal Testing Machine with additional Side Test-Area 200 kN

Item	Description	Qty
1	Electromechanical Universal Testing Machine LFM-1000 Features: • One test area with ergonomically working height • Rigid 6-Column machine frame with high stiffness providing superior axial and lateral stiffness and guarantees robust, durable and long-term operation • High machine stiffness and appropriate machine mass reduces shock at sample failure and provides smooth breaking • Two precise, backlash-free ball screw assembly provides high load capacity, high positioning accuracy and repeatability • Controlled by a brush-less high responsive, maintenance-free AC servomotor to drive the mobile traverse (crosshead) providing faster starts and stops, best control, and highest accuracy at extremely low noise level • AC servomotor provides continuous high test speed up to nominal force for continuously operation • Additional four (4) guiding columns for increased lateral stiffness • Spindles (ball-screws) with flange double-nut, sealed and greased for long maintenance intervals • Spindle, flange double-nut and ball-screw shaft grinded pairwise for reduced pitch error • On-point, in-service lubrication • Spindle protection over full travel through oil- and moisture-resistant, sealed bellows made from polyester fabric, coated with polyurethane inside and out • Precision strain gauge load cell mounted on (moveable) crosshead optional available alignment fixture mounted between crosshead and load cell with related alignment verification equipment • Digital movable crosshead encoder for high resolution, high accurate crosshead measurement and closed loop control • Standardizes mounting to mount grips • Adjustable stops in both (up/down) directions for the best protection of operator, test sample and machine • End stops for maximum travel protection • Electrical cabinet with complete power supply and control module, relays etc. mounted on rear side of machine's base • Durable structured coating (paint) • Use of high quality components and assemblies of reputable companies	1

	• Eye bolts for lifting the machine • Adjustable machine feet to level the testing machine • The machine is free-standing on shock absorbers, requiring no special foundations • Ergonomic working height • High efficiency helical-bevel gearbox (not a worm-type gearbox) provides with a high degree of efficiency of over 96% in both torque directions and at all input speeds. With performance designed to last – high-endurance gearing enables high-torque and wear-free operation, as well a long maintenance-free service life with reduced backlash. • Noise level of testing machine is less than 70 dBA. Technical data: Static test load max. (FN) ± 1000 kN Test speed max. (VN) 0.0005 – 250 mm/min Accuracy according to ISO 7500-1, ASTM E4 from 1 to 100% Cl. 0.5 from 0.5 to 1% Cl. 1 Force measuring resolution $\pm 8'338'600$ points Crosshead measuring system $\pm 8'338'600$ points Crosshead speed accuracy better 0.01% of VN Height of test area 2130 mm Test area width 1100 mm Working height (lower platen) 918 mm Frame stiffness (at 250 mm) 1300 kN/mm Power requirements 3x 400V, 50 Hz, 8.1 kW Colours RAL 7015, RAL 7035 Dimensions WxDxH 1680 x 1180 x 3718 mm Weight 7550 kg Scope 1 pc. Side Test-Area Extension	
2	200 kN Side Test-Area to model LFM-1000 • Load capacity up to 1000 kN in the central testing room • Load capacity up to 200 kN in the lateral testing room Dimensional drawing: 59-5739-001 • Overall dimensions WxDxH 1860 x 1100 x 3718 mm • Working height 918 mm • Testing room 2130 mm • Distance between grips 1200 mm	
3	High Precision Flanged Tension/Compression Load Cell 1000 kN Technical data: • Nominal force 1000 kN • Accuracy class 0.05 • Reproducibility error $\pm 0.005\%$ • Linear error $\pm 0.05\%$	1

- Hysteresis $\pm 0.1\%$
- Rated characteristic value 2 mV/V
- Influence of lateral forces $\pm 0.2\%$ / $0.1F_{nom}$
- Maximum lateral load $\pm 80\%$ (static)
- Influence of torque $F_{nom} \pm 0.005\%$ per mm
- Eccentricity influence $\pm 0.02\%$ per mm
- Overload safe 150%
- Breaking force 300%
- Spring rigidity 5000 kN/mm
- Temperature effect on zero 0.05% /FS/10K
- Operated temperature range -10° till $+60^\circ\text{C}$
- Dimensions $\varnothing \times H$ 240 x 230 mm
- Weight 19 kg
- Scope 1 pc.

4

High Precision Tension / Compression Load Cell 200 kN

Technical data:

- Nominal force ± 200 kN
- Nonlinearity $\pm 0.04\%$ FS
- Hysteresis $\pm 0.05\%$ FS
- Non-repeatability $\pm 0.01\%$
- Creep in 20 min $\pm 0.025\%$
- Temperature effect on zero $\pm 0.0015\%$ RO
- Rated output 4 mV/V
- Max. operating force $\pm 150\%$
- Material alloy steel
- Natural frequency 6.5, 7.0 kHz
- Cable length 3 m
- Operating temperature range -55° to $+90^\circ\text{C}$
- Dimensions $\varnothing \times H$ 154 x 89 mm
- Weight 4.3 kg
- Scope 1 pc.

Ultra-High-Speed High Resolution Digital Materials

5

Testing Controller PCS8000 (V4)

- Technical data:
- Control channels 1 (extendable)
- Number of extendable channels 12
- Number of virtual channels max. 32
- Number of digital output / inputs 12 / 12
- Close loop control rate max. 20 kHz
- Data transfer max. 20 kHz
- Internal data sampling rate max. 2 MHz
- Data acquisition / signal conditioners 24 bit
- Linearity error 0.001%
- Measurement bandwidth without filter 3 MHz
- Control processor GP 64 bit
- Controller version 4
- Serial connections RS232 and RS422/485
- Interfaces to PC Ethernet 10/100 Mbit
- Electric power 90-260V, 47-63Hz, 2A

- Dimensions WxDxH 430 x 320 x 88 mm
- Weight 10.9 kg
- Scope 1 pc.

Scope of supply consists of:

PCS8000 digital controller

Per each digital controller: Two (2) On-Board measuring amplifier one (1) for Strain Gage signals (for example force or torque) and one (1) for LVDT or Digital signal (for example piston/spindle strokes/displacement or rotational angle transducer, encoder etc).

12 digital outputs

8 digital inputs

RS-485 interface to environmental chambers, furnaces and other devices. The interface allows to read up to 10 temperatures for data acquisition through PCS8000 / DION7. Remark: PCS8000/ DION7 allows to temperature acquisition as well as control of environmental chambers, furnaces and other devices by sending set-values as temperature(s), heating speed etc.

Programmable in DION7FPI, DION7STAT, DION7LOW etc

6 **UNI Data Acquisition Module**

Sensor Conditioning Module for Strain-Gage

Transducers

Technical data

- Resolution 24 Bit
- Non-linearity 0.001%
- Sample rate 8.1/10.4/12.4/14.4 kHz
- Differential DC input not galvanically isolated
- Input ranges (DC) ± 10 , 5, 2.5, 1.25 V
- Input ranges (DMS) ± 0.5 , 1, 2, 4, 8 mV/V
- Input voltage max. (DC) ± 11 V
- Input voltage max. (DMS) ± 104 mV/V
- Common mode range ± 10 V
- Connector 15 pins

7 **System Plug with EEPROM for analogue VDC, Strain-Gauge, LVDT or digital signal**

Technical data:

- Static load max. ± 1000 kN
- Dynamic rating (through zero) max. ± 1000 kN
- Clamping force range 0 – 1300 kN
- Sample diameter max. 70 mm
- Flat sample thickness max. 60 mm
- Clamping length 130 mm
- Clamping area max. WxH 150 x 130 mm
- Temperature range -40° to +100°C
- Dimension $\varnothing$ xH 470 x 340 mm
- Weight each 343 kg
- Scope 2 pcs.

8 **Set of Jaws for Flat Specimen 0 – 20 mm**

for WGR-1000/-1500 grips

	• Clamping area WxH 150 x 130 mm • Serration Pyramidal • Hardness 60 HRc • Temperature range -40° to +100°C • Dimensions WxDxH 150 x 90 x 130 mm • Weight each 11.4 kg • Scope 4 pcs.	
9	Set of Jaws for Flat Specimen 20 – 40 mm for WGR-1000/-1500 grips • Clamping area WxH 150 x 130 mm • Serration Pyramidal • Hardness 60 HRc • Temperature range -40° to +100°C • Dimensions WxDxH 150 x 80 x 130 mm • Weight each 9.9 kg • Scope 4 pcs.	
10	Set of Jaws for Flat Specimen 40 – 60 mm for WGR-1000/-1500 grips • Clamping area WxH 150 x 130 mm • Serration Pyramidal • Hardness 60 HRc • Temperature range -40° to +100°C • Dimensions WxDxH 150 x 70 x 130 mm • Weight each 8.3 kg • Scope 4 pcs.	
11	Standalone Hydraulic Grip Supply System PAC-9.7 Technical data: • Pump delivery constant 9.7 l/min • System pressure max. 400 bar • Tank capacity 11.2 litres • Connector oil (internal thread) G3/8" • Oil temperature 45° – 50°C • Sound level 68 dBA • Cable length 5 m • Power Supply 3x 400V, 50 Hz, 3.6 A • Dimensions WxDxH 400 x 850 x 745 mm • Weight 60 kg • Scope 1 pc.	
12	Set of Hydraulic Hoses with Couplings 5 m for a set of WGR-300/-630/-1000/-1500-H, SPG-600-H hydraulic grips, to connect them with a hydraulic power pack. • Length 5 m • Pressure max. 400 bar • Inner diameter 6.3 mm • Temperature range -40° to +100°C • Scope 4 pcs.	
13	Set of Mechanical Wedge Grips Type 109-250 Technical data: • Test load max. 250 kN	

	• Specimen thickness max. 50 mm flat • Specimen diameter max. 50 mm • Sample width max. 50 mm • Length of inserts 110 mm • Adaptation Af 60/30 mm • Temperature range 0° to +70°C • Dimensions WxDxH 246 x 246 x 256 mm • Weight each 70 kg • Scope 2 pcs.	
14	Set of jaws for flat specimens 0 – 30 mm	
15	Rod bar to fix the grips type 109 on the lateral testing room at the same height of the grips WGR-1000 of the main testing room	
16	3-Point Bending Device BT-250 Test force max. 250 kN Specimen width 0 – 100 mm Distance between supports 20 – 300 mm Adaptation Af 60/30 mm Material steel Temperature -70° to +280°C Dimensions WxDxH 360 x 100 x 186 mm Weight 22 kg Scope 1 pc.	
17	NON-CONTACT EXTENSOMETER High Accuracy Video Extensometer Type VEX-ONE-1M9 Technical data: • Classification ISO 9513/ASTM E83 Class 0.5 / B-1 • Measuring accuracy for strain <0.002% according to ISO 9513 • Resolution 0.5 to 1 µm • Dynamic measurement max. 5 – 7 Hz • Measuring rate >30 Hz • Number of cameras 1 (2D representation) • Camera resolution 9 MPx • Lens focal length 25 mm • Standard working distance (Class 0.5) 420 mm • Field of view WxH 125 x 240 mm (Cl. 0.5) • Field of view WxH 250 x 480 mm (Cl. 1) • LED light orange • Electrical power 24V DC, 1 A, 24 W • Operating temperature 10° to 40°C • Operating humidity 30% to 70% • Dimensions WxDxH 186 x 80 x 220 mm • Weight 1.4 kg • Scope 1 pc.	
18	Attachment Kit for Multiple Testing Rooms	
19	Transversal and Bending Strain Software Module	
20	AUTOMATIC CONTACT EXTENSOMETERS UNI Data Acquisition Module Sensor Conditioning Module for Strain-Gage Transducers Technical data • Resolution 24 Bit	

	• Non-linearity 0.001% • Sample rate 8.1/10.4/12.4/14.4 kHz • Differential DC input not galvanically isolated • Input ranges (DC) $\pm 10, 5, 2.5, 1.25$ V • Input ranges (DMS) $\pm 0.5, 1, 2, 4, 8$ mV/V • Input voltage max. (DC) ± 11 V • Input voltage max. (DMS) ± 104 mV/V • Common mode range ± 10 V • Connector 15 pins	
21	System Plug with EEPROM for analogue VDC, Strain-Gauge, LVDT or digital signal Technical data • Connector D-Sub 15-pin • Memory EEPROM 16 kBit • Size of optional available resistance Minimelf MM0204	
22	Automatic Extensometer MFL-300 Technical data: • Measuring range 300 mm (minus L_e) • Measuring direction upwards • Measuring accuracy after ISO 9513 Grade 0.5 • Measuring resolution $0.1 \mu\text{m}$ • Linearity error 0.005% • Gage length setting 10...300 mm • Length of lever arms 218 mm • Gage length setting accuracy better $\pm 0.5\%$ GL • Clamping force approx. 0.5 cN • Activating force < 1 cN • Operating temperature $0 - 50^\circ\text{C}$ • Flat specimen dimensions WxD max. 50/30 mm • Round specimen dimensions $\varnothing$ max. 80 mm • Cable length 5 m • Dimensions WxDxH 452 x 151 x 823 mm • Weight 26 kg • Scope 1 pc.	
23	Universal Mounting Bracket for Multiple Test Rooms • Vertical displacement max. 250 mm • Dimensions WxDxH ca. 800 x 500 x 500 mm • Weight ca. 22 kg • Scope 1 pc.	
24	Automatic Transverse Extensometer MFQ-A Technical data: • Measuring range 4 mm • Specimen widths 12.5, 20, 25, 30 mm • Measuring accuracy after ISO 9513 Grade 0.2 • Indication error rel. $\pm 0.2\%$ • Measuring error $0.6 \mu\text{m}$ • Sensitivity 2 mV/V • Pressure of measuring pins 6 N • Travel of measuring heads max. 20 mm • Compressed air consumption 1 l/min	

	• Pneumatic working pressure 5 – 6 bar • Flat specimen thickness 0.2 – 10 mm • Specimen dimensional tolerance ± 0.2 mm • Voltage supply max. DC 14V • Cable length 5 m • Operating temperature 0 – 50°C • Dimensions WxDxH 143 x 90 x 60 mm • Weight 2 kg • Scope 1 pc.	
25	Mounting Bracket for multiple testing rooms	
26	MODEL FOR MULTIPLE TESTING ROOM • Translation horizontally max. 80 mm • Dimensions WxDxH 460 x 155 x 377 mm • Weight 3 kg • Scope 1 pc.	
27	Desktop PC, HP G9 i7-12700, Windows 10 • Model HP EliteDesk 800 G9-Tower • Processor Intel Core i7-12700 • Base frequency 2.1 GHz • RAM 8 GB DDR5 • SSD hard drive 256 GB 4x4 2280 PCIe • SATA hard drive 1TB 7200 RPM • Graphic card integrated Intel UHD Graphics 630 • Optical drive DVD-RW • Form factor Tower • Operating system Windows 10 Pro 64 Bit • Included accessories keyboard, optical mouse • Electrical power 230V, 50 Hz, 0.26 kW • Dimensions WxDxH 370 x 308 x 168 mm • Weight 9.9 kg • Scope 1 pc.	
28	27" Monitor • Model HP Z27q G3 QHD • Display size 27" • Display type IPS • Display area 597 x 336 mm • Resolution QHD 2560 x 1440 • Electrical power 230V, 50 Hz, 0.069 kW • Dimensions WxDxH 612 x 39 x 356 mm • Weight 5.8 kg • Scope 1 pc.	
29	Service and Maintenance of Testing Equipment min. 10 years	
30	Complete Materials Testing Software Update During 18 Months After Installation	
31	Calibration prior to shipping and delivery of calibration certificates • Calibration certificates for: • Force (ISO 7500-1) • Piston Stroke (ISO EN 9513) • Extensometers (ISO EN 9513)	
32	Complete Set of Operating Manuals and Documentation in English – Soft Copy as a PDF-file via a provided link, contains the following: Included	

	• Full operating and maintenance instructions and technical description • Operation and maintenance instructions • General arrangement drawings • Circuit diagrams and tool kits etc. • Main parts of the manual, as electric drawings, maintenance handbook, safety handbook, controller and software manual.	
--	--	--

SPARE PARTS:

Item	Description	Qty
1	Striker Charpy 2 mm According to ISO 148-2 • Thickness within the specimen area 14 mm • Edge angle $30^{\circ} \pm 1^{\circ}$ • Radius of curvature 2 mm • Scope 1 pc.	1
2	Striker Charpy 8 mm According to ASTM E23 • Thickness within the specimen area 14 ± 4 mm • Edge angle $30^{\circ} \pm 1^{\circ}$ • Radius of curvature 8 ± 0.05 mm • Scope 1 pc.	1
3	Set of Anvil Inserts Charpy according to ISO 148-2/ASTM E23 • Free angle 0° • Relieve cut 11° • Radius of curvature 1 mm • Scope 2 pcs.	1