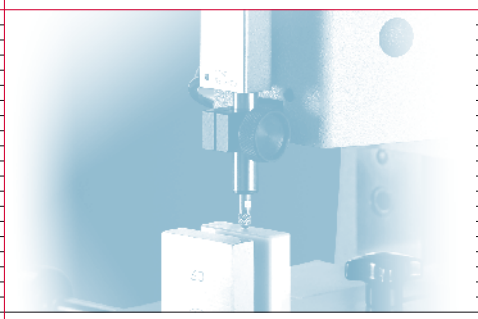
PRECIMAR | PRECISION LENGTH METROLOGY



FOR UNIVERSAL USE

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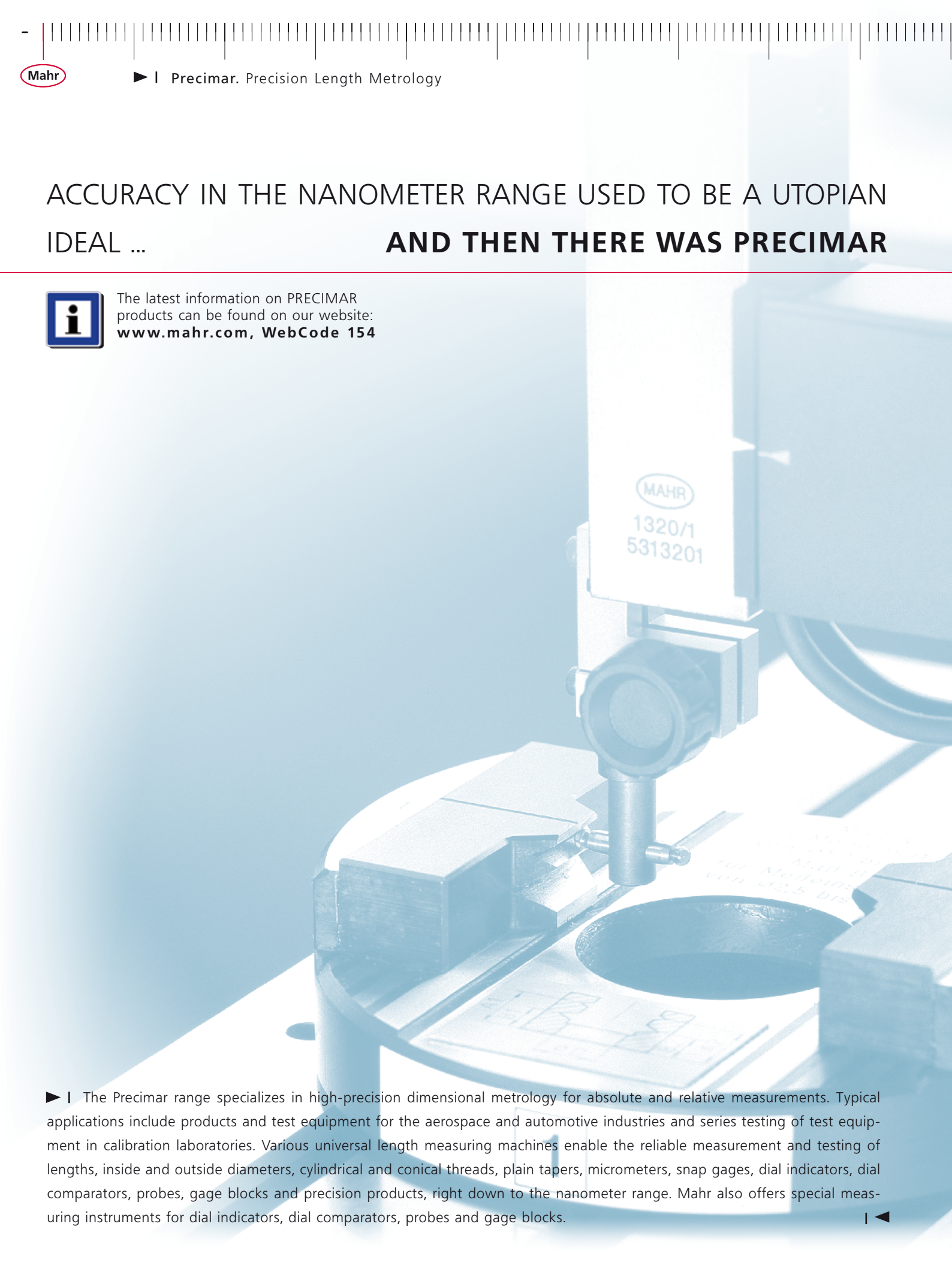
Mahr

EXACTLY

ACCURACY IN THE NANOMETER RANGE USED TO BE A UTOPIAN IDEAL ... **AND THEN THERE WAS PRECIMAR**

The latest information on PRECIMAR products can be found on our website:
www.mahr.com, WebCode 154



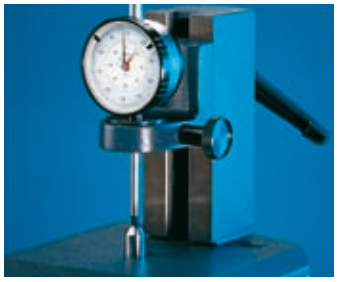
► | The Precimar range specializes in high-precision dimensional metrology for absolute and relative measurements. Typical applications include products and test equipment for the aerospace and automotive industries and series testing of test equipment in calibration laboratories. Various universal length measuring machines enable the reliable measurement and testing of lengths, inside and outside diameters, cylindrical and conical threads, plain tapers, micrometers, snap gages, dial indicators, dial comparators, probes, gage blocks and precision products, right down to the nanometer range. Mahr also offers special measuring instruments for dial indicators, dial comparators, probes and gage blocks. | ◄

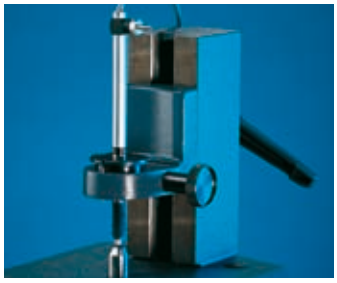
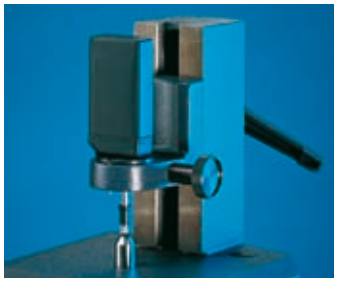
► | Precimar. Precision Length Metrology

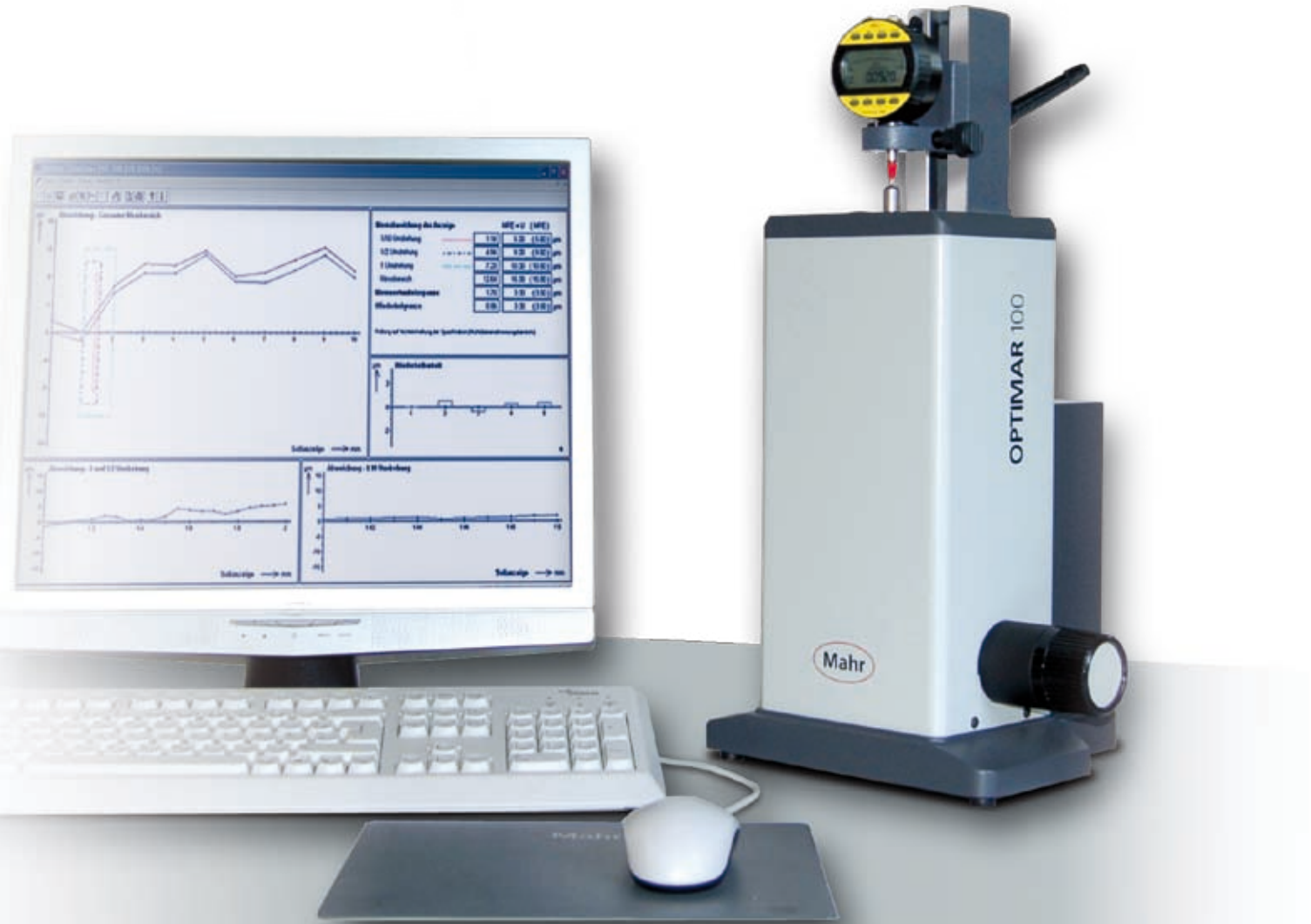
Precimar. Dial Indicator Testing Instruments

SEMI- AND FULLY AUTOMATED TESTING OF MEASURING EQUIPMENT WITH DISPLAYS

► I Dial indicator testing instruments from Mahr ensure efficient and precise metrology. These instruments provide absolute measurements for dial indicators, dial comparators, lever-type test indicators, inside micrometers and inductive and incremental probes. Typical applications include dial indicator testing in all branches of industry, inspection rooms, calibration laboratories and series testing by dial indicator manufacturers. With the Optimar 100, Mahr offers a practical solution for both cost-effective, semi-automated testing of analog dial indicators and efficient, fully automated testing of digital measuring equipment. I ◄





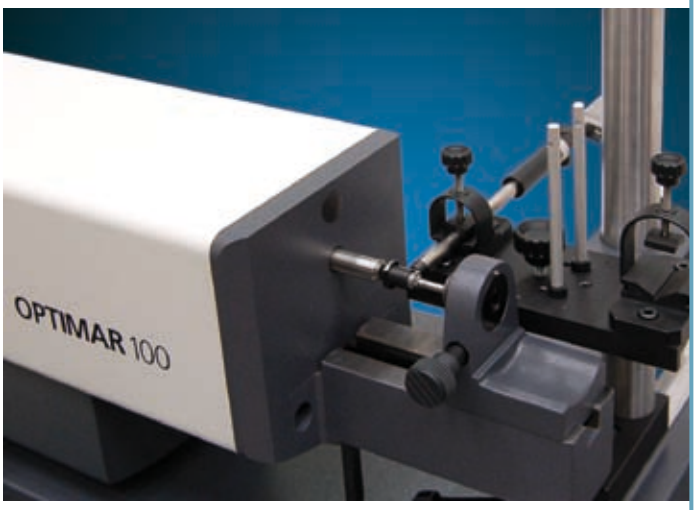
Optimar 100

Universal dial indicator testing machine

Description

The cost-effective testing station for semi- or fully automated testing of dial indicators, dial comparators, lever-type test indicators, 2-point inside measuring devices, and inductive and incremental probes.

Designed as a table-top unit, the **OPTIMAR 100** is user-friendly and ensures fast test runs. It features a motorized drive and is equipped with a high-resolution measuring system. The test run is software-controlled.



Features

- For dial indicators, dial comparators, lever-type test indicators, 2-point inside measuring devices, digital dial indicators and induc tive and incremental probes
- Automation of sub-processes (automated pre-positioning) using motorized measuring spindle drive
- Fully automated measuring run for digital devices
- **OPTIMAR 100** may be used horizontally (e.g. for measuring inside micrometers)
- Testpiece mounting via vertical guide. Height can be adjusted quickly (adaptation of testpieces to different measuring ranges)
- Box-shaped and thus rigid machine casing
- For testpieces with a shaft diameter of 8 mm, 28 mm or 3/8"
- Electronic handwheel for manual control of the measuring spindle's movement. Self-adjusting sensitivity of the electronic handwheel for adaptation to the specific test specimen
- Ergonomic design of all control elements
- Compliance with the Abbe comparator principle for maximum measuring accuracy
- LIF 101 measuring system with computer-aided error compensation. Testing of 2-point inside measuring devices without loss of accuracy
- Length measuring deviation in vertical and horizontal directions: MPE = (0.2 + L/250) µm, L in mm at T = 20 °C ±0.5 °C, permissible temperature gradient 0.1 K/h
- **Mahr software "Optimar"** or **QMSOFT® / QM-DIAL 32**

Application

- For both analog dial indicators, dial comparators, lever-type test indicators and 2-point inside measuring devices and digital dial indicators and inductive and incremental probes.

Accessories

- Mount for lever-type test indicators
- Large selection of adapters for digital dial indicators and inductive and incremental probes
- Please ask for customized adapters if required
- Probe can be connected to Optimar via probe box
- Holder and software for testing 2-point inside measuring devices with a movable meausing bolt (tesing as per VDI/VDE/DGQ 2618, sheet 13.2., 2005)
- Device for force sensor on request
- **OPTIMAR** recalibrated on site by Mahr Service Center (standard or DAkkS/DKD Certificate)
- Calibration set for calibration by the operator

Technical Data

Optimar 100	**Order No. 5320005**
Range of measuring spindle	100 mm, 4 in (101.6 mm)
Measuring system	LIF 101 with correction of measured values
Digital increment	0.02 µm (0.8 µin)
Length measuring deviation (MPE)	(0.2 + L/250) µm, (L in mm)
Positioning speed	Max. 2 mm/s (0.08 in/s)
Positioning	
Pre-positioning:	Automatic
Fine positioning:	Electronic knob
Supply voltage	Via plug-in power supply unit 110/230 V/9 V AC, 18 VA
Dimensions (L x W x H)	235 mm x 216 mm x 480 mm (9.3 in x 8.5 in x 18.9 in)

Precimar. Model 130B-24, the Industry Standard

Now even better: Models 130B-24 and 130B-16.
Gage block comparators

Description

The **130B-24** gage block comparator from **Mahr Federal** is the preferred choice of many major calibration laboratories. It is specifically designed for comparative gage block measurements. The **130B-24** model measures the industry's key dimensional standards with the ultimate in resolution and reproducibility.

Features

- A unique "floating measuring frame" ensures precise point-to-point measurement
- Single-sensor design minimizes electronic noise
- Finely balanced system optimizes control of measuring forces
- Resolution of 0.1 µin (0.001 µm)
- Reproducibility of 0.2 µin (0.005 µm) ($6\sigma < 1$ µin/0.025 µm)
- Measuring capacity of 0.010 in to 4 in (0.25 mm to 100 mm)
- Integrated measuring software and user interface
- Built-in positioner for reproducible measuring positions

Gage block positioner
An accurate positioner is built into the plate of the **130B-24**. The reference gage block and the testpiece gage block are loaded into the openings in the template. The device swivels between the contact points and positions the gage blocks – first the reference gage block and then the testpiece gage block in its reference position and in the corners of the gage block. Three easily exchangeable templates are included, one for square and two for rectangular (30 mm and 35 mm/1.18 in and 1.38 in) gage blocks.

Other templates are available as optional extras. The positioner is suitable for gage blocks from 0.20 in (0.5 mm) to 4 in (100 mm) long. It can be fitted for right- or left-handed users or removed completely if necessary. An acrylic breath shield is included to protect the measuring area against body heat. Please see our special brochure for further information on the **software**.

Technical Data for 130B-24 / 130B-16

Size (without computer)	Approx. 15 in x 15 in x 23 in (385 mm x 385 mm x 590 mm)
Weight (without computer)	Approx. 225 lbs (100 kg)
Max. gage block length	0.010 in to 4 in (0.25 mm to 100 mm)
Measuring force	
(upper contact)	3 oz (0.8 N)
(lower contact)	1 oz (0.3 N)
Contact tip material	Hard metal (diamond - optional)
Contact tip radius	0.125 in (3.175 mm)
Sensor range	± 0.015 in (± 0.38 mm)
Measuring range	± 500 µin (±10.0 µm)
Reproducibility	6 σ < 1 µin (25 nm) measured on a 1 in gage block without removing the gage block
Linearity	Deviation <1 µin over the central ± 50 µin and <1 µin in any 50 µin within the ± 500 µin measuring range < 20 nm over the central ± 1.0 µm and < 20 nm in any ± 1.0 µm over a measuring range of ±10.0 µm

Precimar 130B-16

Model 130B-16 for longer gage blocks

The same highly linear, stable electronics as the 130B-24

Designed for gage blocks of up to 600 mm (24 in) but can also measure shorter blocks.

Approx. size (without computer)
385 mm x 385 mm x 1,016 mm
(15 in x 15 in x 40 in)
Approx. weight (without CPU)
140 kg (309 lbs)
Measuring length
2.5 mm to 600 mm (0.10 in to 23.6 in)
Measuring force
(upper probe) 4 oz., 1.1 N
(lower probe) 2 oz. ,0.6 N

All other data as for the **130B-24**.

Precimar 826 PC Gage Block Measuring Unit

Description

The **826 PC** gage block measuring unit is fast, reliable and extremely precise. In comparative measurement, it achieves a reproducibility of 0.01 µm.

An open and extremely rigid L-shaped stand forms the basis for the two opposing high-precision probes, and the perfectly level measuring table.

Work is made easy thanks to straightforward one-handed operation for manipulating reference and test gage blocks on the measuring table. The open design allows visual contact during testing.

The user is able to view the measuring process at all times which helps to ensure a unique level of process reliability.

Two professional measuring and evaluation programs (software) meet all the needs of internal gageblock tests, calibration laboratories and gageblock manufacturers.

The **826** enables quick and straightforward high-precision testing of European and US gage blocks up to 170 mm (6.69 in) long in accordance with ISO 3650.

Features

- Rigid cast-iron stand ensures a stable temperature and insensitivity to heat
- Easily adjustable vertical slide with upper probe
- Very ergonomic and convenient one-handed operation for positioning the gage block under the probe
- Fine adjustment via rigidly connected parallelogram springs
- Electropneumatic lifting of the probes
- Extremely smooth manipulator operation thanks to high-precision ball bushings
- Measurement not influenced by manual force applied
- Gage blocks easy to move on the measuring table thanks to round, hardened high-precision support pins
- No zero point setting required, since the set value is offset by the stored actual allowance of the respective reference gage block
- Very effective protection from heat due to an acrylic glass screen along the sides of the unit
- Flattening correction
- Correction of differing coefficients of thermal expansion
- Calculation of mean values
- Two measuring and evaluation programs: Calibration and data management or additionally with customer management, gage-block storage management and multi-test-unit management

Technical Data

826 gage block measuring unit Order No. 4448003

Application range	0.5 mm to 170 mm (0.02 in to 6.69 in)
Usable table surface	60 mm x 55 mm (2.36 in x 2.17 in)
Reproducibility	± 0.01 µm (0.4 µin)
Stylus ball radius, upper probe	1.5 mm (0.06 in)
Stylus radius, lower probe	1.5 mm (0.06 in)
Direct measuring range	0.2 mm (0.0008 in)
Weight	37 kg (81.6 lbs)

For testing gage blocks over 170 mm long (central length lm) we recommend the **ULM**, **828 CiM** or **PLM** universal measuring machines.

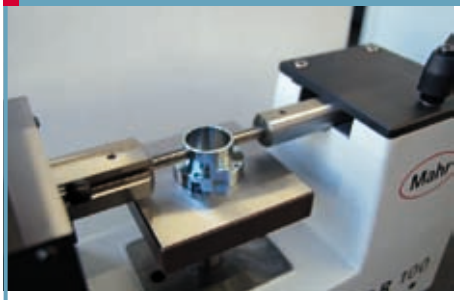
Accessories

- **QM-Block** calibration software for calibration and data management of gage blocks and sets of gage blocks
- The evaluation software runs under Windows® NT/2000/XP

LINEAR. Setting and Measuring Instruments
FOR GENERAL USE IN WORKSHOP LENGTH METROLOGY

► I The LINEAR product range satisfies today's manufacturing requirements. LINEAR length measuring instruments are used as setting and measuring instruments and deliver measuring results quickly and reliably, even in rough workshop environments. Priority is given to simple operation. LINEAR length measuring instruments are an economical alternative for setting internal and external comparators, internal precision measuring instruments and snap gages with displays. I ◄

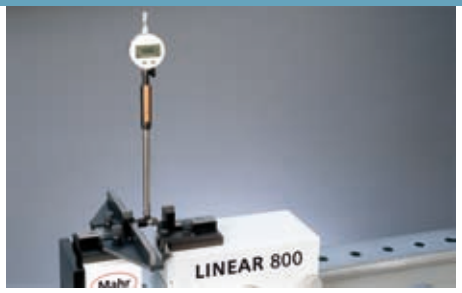
LINEAR 100




Measuring/testing of small parts up to 100 mm

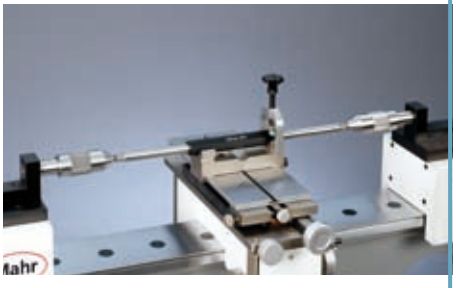
The LINEAR 100 is optimal for simple and fast outside and inside measurements in the production process, and with very high precision (better than with a micrometer). Typical applications include outside diameter measurements (bolts, turned parts etc.) and testing with dimension over balls on outside and inside toothed parts.

LINEAR 800 / 1200 / 2000



Setting of indicating measuring devices

The LINEAR units are predestined for easy and fast setting of indicating measuring units instead of using setting rings, gage blocks and setting masters, for example, setting:
- universal probes (like Multimar 844 T)
- 2-pt. inside measuring devices (like Subito)
- snap gage with dial comparator
- bore gages
- inside micrometers
- outisde micrometers



Measurement/Testing of parts and measuring devices

In addition to setting measuring devices, the LINEAR units are also very suitable for testing measuring devices such as micrometers, setting pins, depth gages, calipers as well as plug gages, ring gages, and to measure production parts such as inside dimensions/bores, cylindrical and rod-shaped parts.

LINEAR 100

Description

Internal and external measurements on workpieces < 100 mm

LINEAR 100 is a universal, user-friendly length measuring instrument for rapid, precise internal and external measurements up to 100 mm (4 in), directly in the manufacturing environment. The unit's simple design makes it possible to carry out measurements in no time at all and adapt quickly to new measurement tasks. The instrument can be used to measure and test lengths, diameters, gears and much more.

LINEAR 100 measuring station consisting of:
- Linear 100 universal measuring instrument including 70 x 70 mm object table with electronic display (and connection cable.
- Measuring anvils for internal measurements from 15 mm to 100 mm and external measurements from 0 mm to 100 mm
- Measuring anvils for external measurements, planar diameter of 6.5 mm
- Cardboard packaging

Features

- Damped measuring spindle with 2 pre-selectable measuring forces
- Measuring force remains virtually constant over the entire measuring range
- Direct measuring range of 50 mm
- Integrated measuring system based on the Abbe principle
- Infinitely adjustable measuring tables for precise measuring position adjustment
- Combined internal/external measurement possible without recalibration
- Easily exchangeable anvils which can be tailored to suit the specific measurement task
- Solid cast body to avoid stresses and twisting errors from the outset
- MarCheck measuring value display with 2 channels (optionally with stand), with USB connection for printer or stick has an RS 232 interface, for easy transfer of measured values to PCs
- MarCom software (optional) allows measured values to be transferred to all Windows programs (e.g. Microsoft Excel)
- Various accessories are available on request

Accessories / Options

- Set for external measurements (diverse measuring inserts)
- Set for internal measurements (probe pair from 6 mm on, floating table, among others)
- Set center support
- Support plate for cylindrical workpieces
- Footswitch, data cable, stand for display unit
- Outside and inside probe with bore M 2.5 for toothing measuring balls
- Software MarCom for measuring value entry into Windows programe

Universal single-axis length measuring unit

LINEAR 100. Technical Data

Measuring uncertainty	(MPE_{E1} = 0.7+L/1000) µm
Direct measuring range	50 mm (2 in)
Application range	
for external measurements:	0 to 100 mm (0 in to 4 in)
for internal measurements:	15 to 100 mm, 6 to 100 mm if required
Support tables	Height adjustable for internal and external measurements
Measuring force	Can be set to 1 N or 3 N, switchable externally and internally
Order No.	**5357300 /5357301**

MarCheck. Technical Data

Dimensions	L 260mm / W 180mm / H 50mm
Weight	Electronics with plug-in power supply: 2 kg (without unit base)
Display	LCD monochrome, 240 x 160 pixels with background illumination Digit size measuring axes ca. 13 mm
Resolution per measuring channel can be independently set	0.0001mm; 0.001mm; 0.01mm 0.00001inch; 0.0001inch; 0.001inch 0.001°decimal; ° min, sec
Incremental inputs	T1; T2; T3 sin/cos 1Vss 15 pol. sub D
Data interfaces	1x RS 232, 1x USB slave connection to PC for data exchange and software installation, 1 x USB master 16 FAT max. 3 GB USB stick; connection to USB printer, preferrably Mahr no. 4429015 Only the print record HP PCL5 is supported
Unit of measure	mm / inch can be set in the MENU

Precimar. LINEAR 800, 1200

Universal single-axis length measuring and setting instruments

Description

LINEAR length measuring instruments from **Mahr** are ideal for use as setting and adjusting instruments in the manufacturing environment. They allow precise setting of internal and external comparators, internal precision measuring instruments, snap gages with displays and many other measuring instruments.
As an infinitely adjustable measurement standard, the LINEAR series is also an economical alternative to setting gages, setting rings and gage blocks.
The simple handling and short measuring time are key advantages. A measuring force control feature can be activated to allow measuring results independent of the user for both internal and external measurements.
Based on the steel scale, the **LINEAR** series ensures reliable measuring results over the entire measuring range.
Compatibility with national standards means that **LINEAR** length measuring instruments are DIN EN ISO 9000-compliant.

For universal use
A large number of contacting elements, anvils and clamping devices are available to satisfy all manner of requirements.

Features

Applications
- Setting measuring instruments with displays such as the Multimar 844T
- Setting two-point internal measuring instruments such as the 844 N
- Setting indicator snap gages such as MaraMaeter 840 F
- Testing and checking setting external micrometers
- Checking setting dimensions, pins etc.
- Checking calipers
- Testing and setting inside micrometers
- Measuring cylindrical parts
- Measuring internal dimensions and bores, etc.

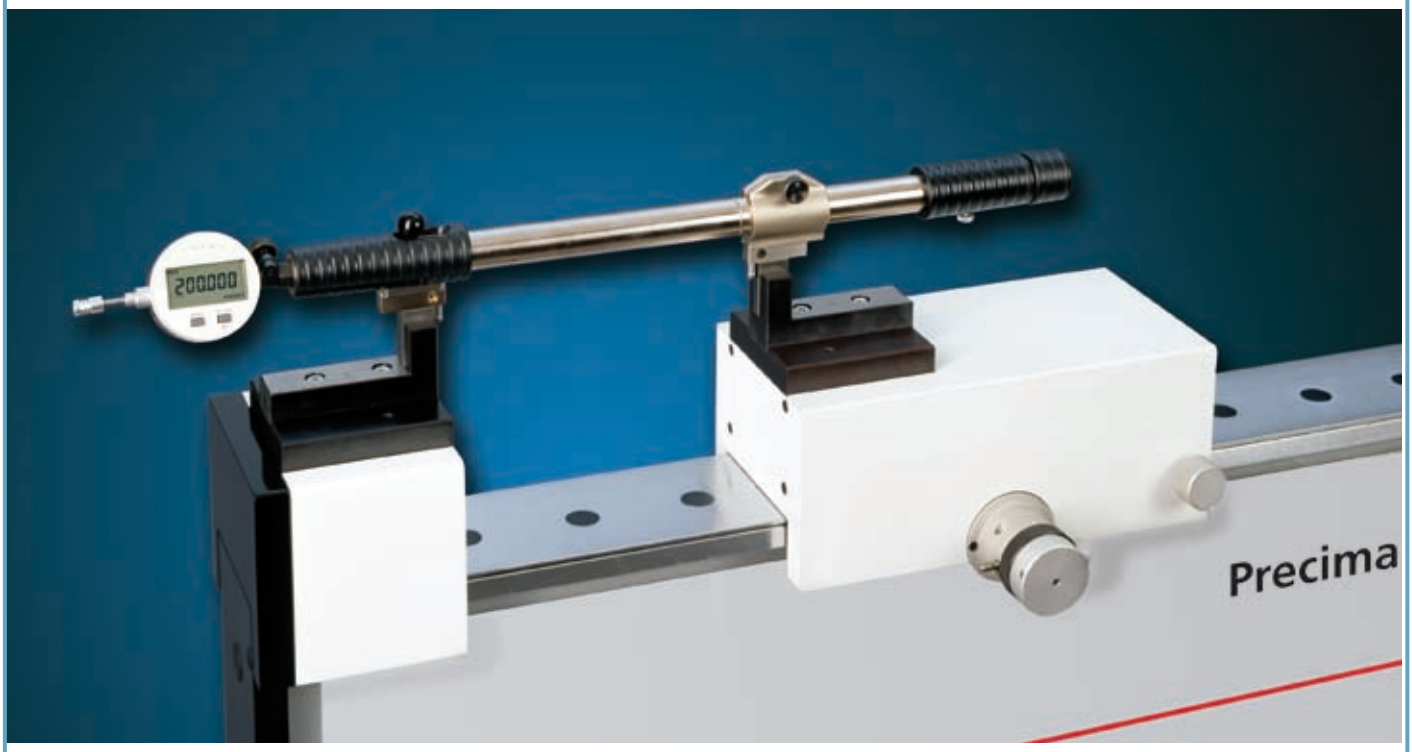
Measured values are displayed on the clearly laid out **MarCheck** digital display which has a large number of measuring functions. In addition, the display unit has a USB connection for printer or stick, USB connection and RS 232 interface to transfer measured values to PCs.

Versions

LINEAR 800	**Order no. 5357302**
LINEAR 1200	**Order no. 5357303**
LINEAR 2000	**Order no. 5357304**

Additional lengths upon request

Precimar. LINEAR 800, 1200, 2000



Features

- Steel base beam, therefore similar thermal behavior such as the setting and measurng objects
- Highly-precision polished and lapped guid rail, rust-proof
- Glued steel scale
- Easy operation
- Can be precisely set to 1/10 µm

Accessories / Options

- Testing device for external micrometers
- Clamping device for internal precision measuring instruments for universal measuring table
- Support for large internal measuring instruments for precise positioning of 2-point internal precision measuring instruments when setting on the LINEAR
- Support with adjustable height for setting internal precision measuring instruments
- Support plates for rings larger than 200 mm (7.87 in).
- Holding device for long measuring devices
- Support for snap gage with dial comparator
- Universal measuring table, height measuring system for universal measuring table
- Additional support table for long measuring objects
- Measuring inserts with balls Ø 20 mm (0.787 in); with one-sided spherical gage blocks; with spindle Ø 15 mm (0.59 in) and Ø 7.5 (0.295 in) mm
- Callipers, internal measuring devices, slip-on heads, clamping elements
- Testing device for grooves
- Support for internal micrometers
- Temperature compensation

Details on metrological accessories are available on request.

Precimar. LINEAR Applications in the Manufacturing Environment

Testing calipers:

Sample measuring sequence:

- Apply caliper
- Set dimension on calipers
- Contact measuring surfaces
- Read off value displayed on MarCheck
- Assess difference between values measured by caliper and MarCheck display in accordance with VDI 2618/DIN 862

Measuring internal dimensions / bores

Sample measuring sequence:

- Clamp caliper
- Position reference ring on object table and fix in place
- Set up reference ring and set display to reference dimension
- Insert testpiece and fix in place
- Contact testpiece with calipers and adjust, activating reversing point at the same time
- Read off measuring result on MarCheck and evaluate

Measuring cylindrical parts

Sample measuring sequence:

- Bring together spindles
- Set to zero on MarCheck
- Position testpiece on object table and fix in place
- Contact testpiece and adjust, activating automatic extreme value recognition at the same time
- Read value on MarCheck and evaluate

General note on all measurements:
The values of the measuring results are clearly shown on the digital display and evaluation unit **MarCheck.**

LINEAR. Technical Data

Description **Order no.**		**LINEAR 800** **5357302**	**LINEAR 1200** **5357303**	**LINEAR 2000** **5357304**
External meas.	(mm)	0 to 820	0 to 1220	0 to 2020
Internal meas.	(mm)	1 to 650	1 to 1050	1 to 1720
Unit dimensions	L x W x H (mm)	1.250 x 240 x 460	1.650 x 240 x 460	2.450 x 240 x 460
Unit weight	in kg	approx. 155	approx. 210	approx. 320

Notes:
*) On request
**) Max. workpiece weight 20 kg (44 lbs)
All values in mm (inch values in brackets).
In some cases, additional standards and optional accessories are required to achieve the measuring ranges indicated.

Values higher or lower than those given can be achieved with special accessories.
The concrete geometry and weight of the testpiece may restrict the measuring ranges indicated.

Performance Data for All Models

Length measuring system X-axis Instrument system	Resolution Length measuring deviation Reproducibility		0,1µm; 0,5 µm; 1 µm; 5 µm; 10 µm (selectable) $MPE_{E1} \leq (0.7 + L/1{,}000)$ µm (L in mm) at 20° C 0.5 µm	
Measuring force			3 N	
Max. workpiece weight for mesauring obejct table		25 kg	25 kg	25 kg
Large universal measuring table		110 x 240	110 x 240	110 x 240

Operating Conditions

Electrical connection values	unit, evaluation unit	5 W	5 W	5 W
Humidity		35 - 80 %	35 - 80 %	35 - 80 %
Ambient temperature for operational readiness		15 to 45 °C	15 to 45 °C	15 to 45 °C

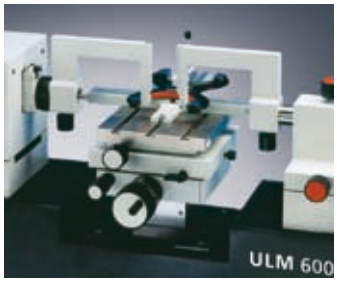
Basic Equipment Consisting of:

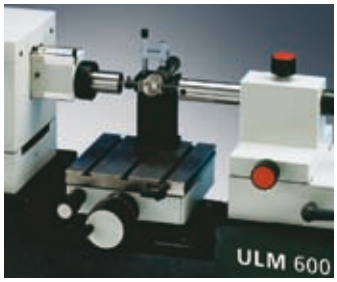
- Basic bar with guide rail and steel scale
- Fixed bearing with gage block insert
- Measuring slide with gage block insert, fine adjustment (2 levels) and measuring force connection
- Display electronics MarCheck with 2 channels, USB connection for printer or stick and USB connection for PC as well as RS 232 interface

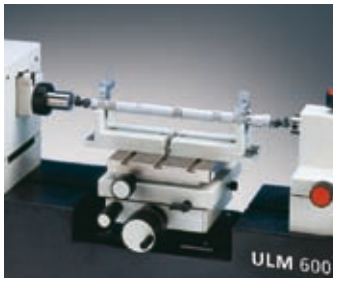
Precimar. ULM Length Measuring Instruments

LENGTH MEASURING INSTRUMENTS FOR CALIBRATION METROLOGY

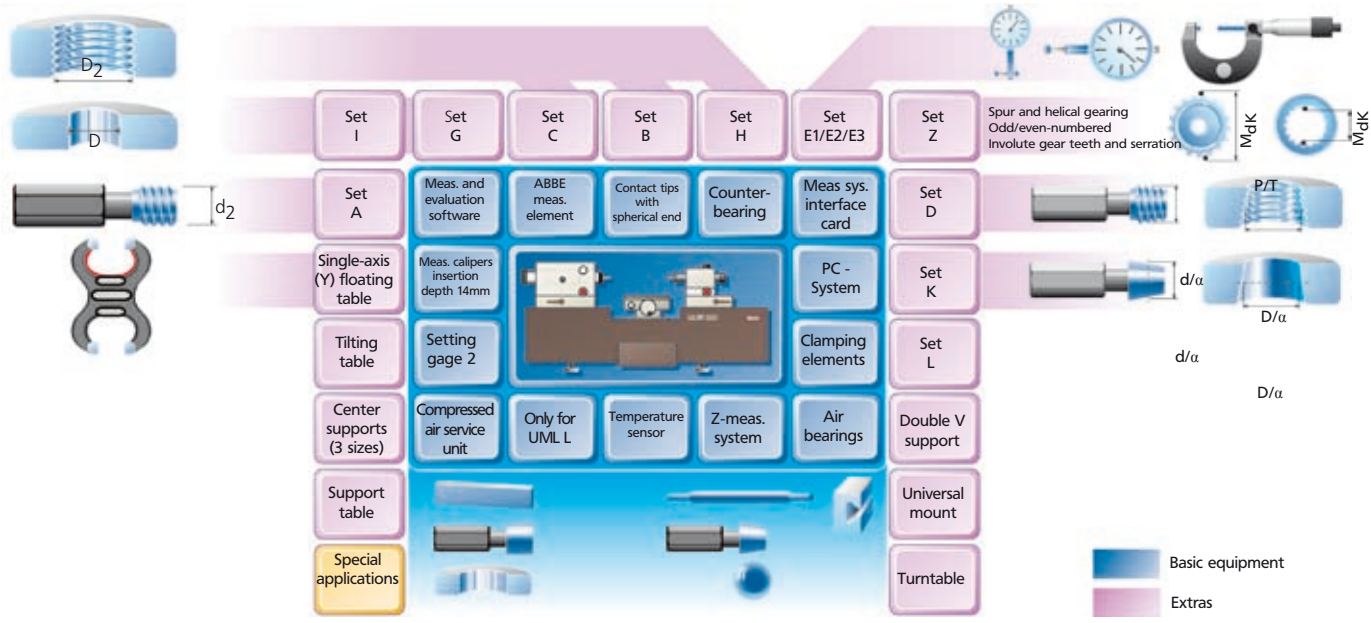
► I The well-established ULM universal length measuring instruments are standard quality assurance instruments in industrial manufacturing environments and reference instruments for gage and test equipment calibration. They are used for high-precision length measurements on precision parts such as gears, journals, ball hubs, ball cages, ball rings, tapers, gear shafts etc. and for checking gages and test equipment. These instruments are available for several measuring ranges (300 mm to 1,700 mm/11.81 in to 66.93 in), in various accuracy classes (0.3 µm to 0.1 µm/ 12 µin to 4 µin) and with the measuring system arranged in a number of different ways (in the measuring element or base or as a laser). This means that the right measuring instrument can be selected for each and every application. The varied sets of accessories and components are available as modules which also enables subsequent instrument additions. I ◄







Precimar. ULM System Overview



Main Applications

Calibration of

- Plain plug and ring gages
- Setting rings
- Snap gages
- Spherical gages, gages for deep bores
- Gage blocks
- Thread gages
- Taper and taper thread gages
- Spline gages
- Dial indicators
- Dial comparators
- 2-point internal measuring instruments
- Micrometers

Reasons for Choosing ULM

Universal length measuring machines

Technical solution	User benefit
Granite Air bearing technology	Variable length and highly rigid Greater productivity through rapid movement of Abbe measuring element and tailstock
Online temperature monitoring	Correction of different expansion behavior of granite and metal and correction of systematic measuring errors due to temperature fluctuations in testpiece and setting standard
Z measuring system	Greater productivity and option of 2D measuring methods by incorporating Z position and travel values
Large number of accessories	Adaptability to measurement tasks thanks to specially configured accessory sets and individual components
Laser meas. system (with ULM L)	Large direct measuring range with maximum measuring accuracy
Powerful MS Windows software	Maximum convenience thanks to clear and simple user navigation

ULM Universal Length Measuring Instruments

ULM
Direct measuring range: 100 mm (4 in)

$MPE_{E1} = (0.1+L/2{,}000)\ \mu m$
or $MPE_{E1} = (0.3+L/1{,}500)\ \mu m$

Measuring system configuration:

Application ranges:

ULM 300
external up to 305 mm, internal up to 150 mm
$MPE_{E1} = (0.1+L/2{,}000)\ \mu m$
Id No. 5355024

ULM 600
external up to 640 mm, internal up to 485 mm
with air bearing units
$MPE_{E1} = (0.3+L/1{,}500)\ \mu m$
Id No. 5355025
$MPE_{E1} = (0.1+L/2{,}000)\ \mu m$
Id No. 5355026

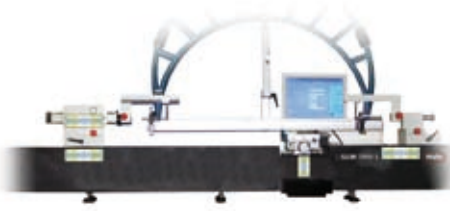
ULM 1000
external up to 1060 mm, internal up to 905 mm
with air bearing units
$MPE_{E1} = (0.3+L/1{,}500)\ \mu m$
Id No. 5355027
$MPE_{E1} = (0.1+L/2{,}000)\ \mu m$
Id No. 5355028

ULM 1500
external up to 1,560 mm,
internal up to 1,405 mm
with air bearing units
$MPE_{E1} = (0.3+L/1{,}500)\ \mu m$
Id No. 5355031
$MPE_{E1} = (0.1+L/2{,}000)\ \mu m$
Id No. 5355032

ULM S
Direct measuring range = application range

with meas. element (100 mm/4 in meas. range):
$MPE_{E1} = (0.1+L/2{,}000)\ \mu m$
with base meas. systems:
$MPE_{E1} = (0.6+L/1{,}000)\ \mu m$

Measuring system configuration:



Application ranges:

ULM 520 S
external up to 520 mm, internal up to 365 mm with air bearing units
Id No. 5355033

ULM 1000 S
external up to 1,025 mm, internal up to 870 mm with air bearing units
Id No. 5355034

ULM L
Direct measuring range: 525 / 1,115 mm (20.67/43.90 in)

$MPE_{E1} = (0.1+L/2{,}000)\ \mu m$

Measuring system configuration:

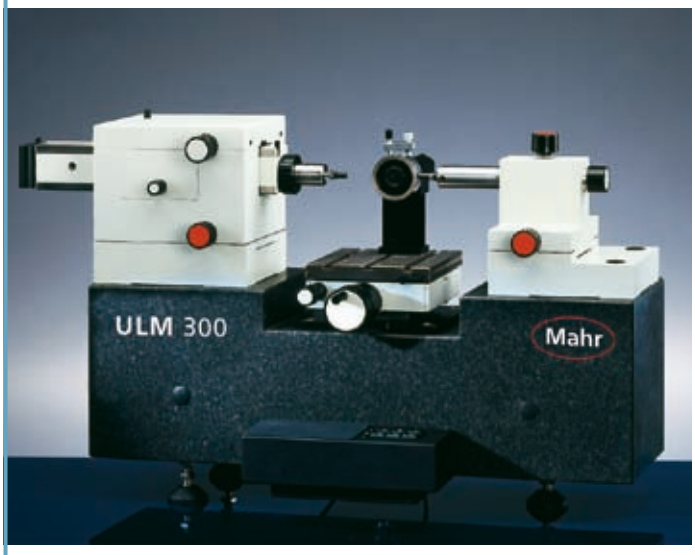
Application ranges:

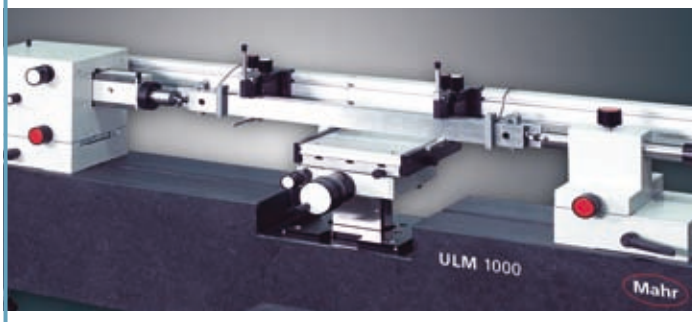
ULM 800 L
external up to 830 mm, internal up to 670 mm with air bearing units
Id No. 5355029

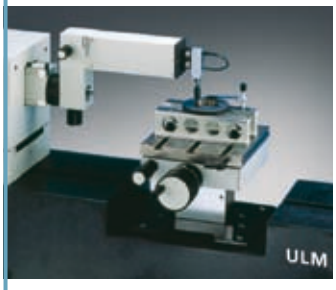
ULM 1500 L
external up to 1,620 mm,
internal up to 1,465 mm
with air bearing units
Id No. 5355030

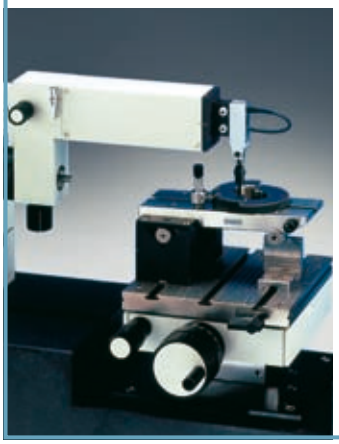
Precimar ULM 300 / 600 / 1000

Universal length measuring instruments









Description

Model
Comparator with horizontal base (highly homogeneous and rigid granite)

Measuring system

X-axis:	Incremental, high-precision Heidenhain length measuring system, 100 mm (4 in) long
Z-axis	Incremental Heidenhain reflected light measuring system, 80 mm (3.15 in) long

Drives

X-axis:	Manual movement and fine motion control
Y-axis:	Micrometer, 25 mm (0.98 in) (analog or digital)
Z-axis:	Permanent field motor for motorized adjustment of object table height with 3 speeds

Measuring force generation
Mechanical using weights

Operation
- Measuring spindle, manual
- Air bearings make it very easy to position the measuring element and counter-bearing (not with ULM 300)
- Height of object table can be adjusted using buttons

Features

- Excellent measuring accuracy
- 100% compliance with Abbe comparator principle
- Online temperature measurement with 2 to 4 sensors
- Computer-aided correction of systematic machine errors (CAA)
- Computer-aided stabilization of instrument zero point
- Computer-aided correction of temperature and measuring force influences
- Measuring force remains constant over the entire measuring spindle adjustment range
- Large object table (load capacity 25 kg (55 lbs)) guided with high precision in the Z-direction
- Automatic reversal point recognition for static and dynamic measured value acquisition
- Great flexibility in the application range
- Large number of modular accessory sets and components to solve the most diverse measurement tasks, including threads, tapers, taper threads and gears
- Measuring and evaluation software runs under MS Windows

Details on metrological accessories are available on request.

Versions

ULM 300
ULM 600
ULM 1000

Precimar ULM 520 S / 1000 S

Large universal length measuring instruments with large direct measuring range

Description

Model
Comparator with horizontal base (highly homogeneous and rigid granite)

Measuring system

X-axis:	In the measuring element, incremental high-precision Heidenhain length measuring system, 100 mm (4 in) long; in the base, incremental Heidenhain reflected light measuring systems over entire length of base to left and right of object table
Z-axis:	Incremental Heidenhain reflected light measuring system, 80 mm (3.15 in) long

Drives

X-axis:	Manual movement and fine motion control
Y-axis:	Micrometer, 25 mm (0.98 in) (analog or digital)
Z-axis:	Permanent field motor for motorized adjustment of object table height with 3 speeds

Measuring force generation
Mechanical using weights

Operation
- Measuring spindle, manual
- Air bearings make it very easy to position the measuring element and counter-bearing
- Height of object table can be adjusted using buttons

Features

- Combined measuring instrument for very high-precision measurements in the range up to 100 mm (4 in) and standard-precision measurements over the entire range of movement of the measuring element and counter-bearing. X measured value formed from the measuring systems of the measuring element and the base
- Particularly recommended for measurements on large testpieces, but also suitable for measurements on smaller testpieces
- Online temperature measurement with 3 sensors
- Computer-aided stabilization of instrument zero point and correction of systematic machine errors (CAA)
- Measuring force remains constant over the entire measuring spindle adjustment range
- Computer-aided correction of temperature and measuring force influences
- Large object table (load capacity 25 kg (55 lbs)) guided with high precision in the Z-direction
- Large number of modular accessory sets and components to solve the most diverse measurement tasks, including threads, tapers, taper threads, gears and ball faces

Versions

ULM 520 S
ULM 1000 S

Precimar ULM 800 L / 1500 L

Universal length measuring instruments with laser measuring system

Description

Model
Comparator with horizontal base (highly homogeneous and rigid granite)

Measuring system

X-axis:	Interferential laser measuring system, 525/1,115 mm (20.67/43.90 in) long
Z-axis:	Incremental Heidenhain reflected light measuring system, 80 mm (3.15 in) long

Drives

X-axis:	Manual movement and fine motion control
Y-axis:	Micrometer, 25 mm (0.98 in) (analog or digital)
Z-axis:	Permanent field motor for motorized adjustment of object table height with 3 speeds

Measuring force generation
Mechanical using weights

Operation
- Measuring spindle, manual
- Air bearings make it very easy to position the measuring element (with laser reflector) and counter-bearing
- Height of object table can be adjusted using buttons

Features

- A high-end length measuring instrument with a large direct measuring range
- 100% compliance with Abbe comparator principle
- Correction of laser in terms of environmental influences such as temperature and air pressure (humidity optional)
- Separate laser generating unit outside the measuring instrument and supply by means of light-conducting cable plus laser unit cover
- Computer-aided stabilization of instrument zero point and correction of systematic machine errors (CAA)
- Online temperature measurement and computer-aided correction of temperature and measuring force influences
- Measuring force remains constant over the entire measuring spindle adjustment range
- Large object table (load capacity 25 kg) guided with high precision in the Z-direction
- Automatic reversal point recognition for static and dynamic measured value acquisition
- Very flexible application range (both the very smallest and large testpieces can be measured)
- Large number of modular accessory sets and components to solve the most diverse measurement tasks, including threads, tapers, taper threads and gears

Versions

ULM 800 L
ULM 1500 L

ULM 300 / 600 / 1000 / 1500 und ULM 800 L / 1500 L Technical Data

Measuring ranges		ULM 300	ULM 600 / 1000 / 1500	ULM 800 L /1500 L
External measurement	Direct	0 to 100	0 to 1000	0 to 525 / 1,115
	Difference	0 to 305	0 to 640 / 1,060 / 1,560	0 to 830 / 1,620
Internal meas.		0.5 to 150	0.5 to 485 / 905 / 1,405	0.5 to 670 / 1,465
Taper meas.	External	0 to 305	0 to 640 / 1,060 / 1,560	0 to 830 / 1,620
Internal		4 to 150	4 to 485 / 905 / 1,405	4 to 675 / 1,465
Cylindrical thread	External d2 (P = 0.2 to 6)	0.8 to 200*	0.8 to 200*	0.8 to 200*
	Internal D2 (P = 0.45 to 6)	2.6 to 150	2.6 to 340 / 760 / 1,260	2.6 to 530 / 1,320
	Lead (P/T)	–	(0.35),0 to 5.5 (6.5)	(0.35)1.0 to 5.5 (6.5)
Taper thread	External d2	2.6 to 50	2.6 .to 85	2.6 to 85
	Internal D2	2.6 to 70	2.6 to 125	2.6 to 165(205)
Gear	External MdK	7 to 295	7 to 630 / 1,050 / 1,550	7 to 820 / 1,610
	Internal MdK	20 to 155	20 to 490 / 910 / 1,410	20 to 680 / 1,470
Measuring instruments with displays	Micrometers, dial indicators, dial comparators, lever-type test indicators, two-point internal measuring instr., Inside micrometers	5 to 100	5.0 to 300 / 780 / 780	5.0 to 550 / 1340
		up to 100	up to 100	up to 100
		–	0 to 360 / 780 / 1,280	0 to 615 / 1,205
		0 to 305	0 to 640 / 1,060 / 1,560	0 to 830 / 1,620

Notes:
* Details in brackets with single measuring wires.
All values in mm.
In some cases, additional standards and optional accessories are required to achieve the measuring ranges indicated.

Values higher or lower than those given can be achieved with special accessories
The concrete geometry and weight of the testpiece may restrict the measuring ranges indicated.

Performance Data

Length meas. system X-axis	Resolution	selectable 0.01 µm or 0.1 µm		selectable 0.01 µm or 0.1 µm
Length meas.-system Z-axis	Resolution	0.1 µm		0.1 µm
Instr. system	Length measuring deviation MPE_{E1}	**) ≤(0.1+L/2,000) µm or ≤ (0.3+L/1,500) µm		≤ (0.1+L/2,000)µm
	Reproducibility	0.05 µm or 0.1 µm		0.05 µm
Travel speed	Object table adjustment	0.015 mm/s; 0.3 mm/s; 6 mm/s		0.015 mm/s; 0.3 mm/s; 6 mm/s
	Measuring spindle	(0 to 250) mm/s		(0.2 to 250) mm/s
Measuring forces		0.2 N; 1.0 N to 4.5 N; 11 N		0.2 N; 1.0 to 4.5 N; 11 N

Dimensions, Weights and Operating Conditions

Instrument-dimensions,	L x W x H	685 x 280 x 480	1,080/ 1,500/ 2,000 x 380 x 480	1,500 / 2,300 x 380 x 480
Instrument weight	in kg	110	160 / 215 / 280	220 / 325
Testpiece weight	for testpiece table	25 kg	25 kg	25 kg
	for support table	-	10 kg	10 kg
Electrical connection data	Instrument, PC, laser	220 (110) V; 50 Hz to 60 Hz; approx. 750 VA		220 (110) V; 50 Hz to 60 Hz; approx. 750 VA
Compressed air		-	3 bar (0.3 MPa)	3 bar (0.3 MPa)
Air consumption		-	≤ 4 l/min at 3 bar	≤ 4 l/min at 3 bar
Humidity		-	≤ 60%	≤ 60%
Ambient temperature for operational readiness		+15 °C to +35 °C		+15 °C to +35 °C

* ≤ (0,3 + L/500) µm possible as an option for ULM

ULM 520 S / 1000 S Technical Data

Measuring ranges		ULM 520 S	ULM 1000 S
External measurement	Direct	0 to 520	0 to 1,025
	Difference	0 to 520	0 to 1,025
Internal meas.		0.5 to 365	0.5 to 870
Taper measurement	External	0 to 520	0 to 1,025
	Internal	4 to 365	4 to 870
Cylindrical thread	External d2 (P=0.2 to 6)	0.8 to 200*	0.8 to 200*
	Internal D2 (P=0,45 .to 6)	2.6 to 195	2.6 to 615
	Lead (P/T)	(0.35) 1.0 to 5.5 (6.5)	(0.35) 1.0 .to 5.5 (6.5)
Taper thread	External d2	2.6 to 85	2.6 to 85
	Internal D2	2.6 to 165**	2.6 to 165**
Gear	External MdK	7 to 510	7 to 1,015
	Internal MdK	20 to 370	20 to 875
Measuring instruments with displays	Micrometers, dial indicators, dial comparators, lever-type test indicators, two-point internal measuring instr., Inside micrometers	5 to 180	5 to 745
		up to 100	up to 100
		–	–
		0 to 520	0 to 1,025

Notes:
* Details in brackets with single measuring wires.
** Reduced accuracy if > 125 mm
All values in mm.
In some cases, additional standards and optional accessories are required to achieve the measuring ranges indicated.
Values higher or lower than those given can be achieved with special accessories.
The concrete geometry and weight of the testpiece may restrict the measuring ranges indicated.

Performance Data

Length meas. system X-axis	Resolution	selectable 0.01 µm or 0.1 µm
Length meas. system Z-axis	Resolution	0.1 µm
Instr. system	Length measuring deviation	With ABBE measuring element only: $MPE_{E1} = (0.1 + L/2{,}000)$ µm With base measuring system: $MPE_{E1} = (0.6 + L/1{,}000)$ µm
	Reproducibility	0.1 µm
Travel speed	Object table adjustment	0.015 mm/s; 0.3 mm/s; 6 mm/s
	Measuring spindle	(0 to 250) mm/s
Measuring force		0.2 N; 1.0 to 4.5 N; 11 N

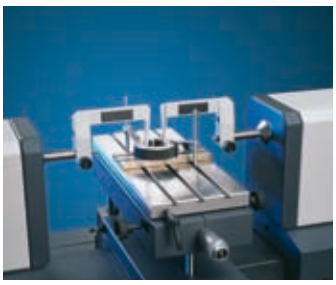
Dimensions, Weights and Operating Conditions

Instrument	L x W x H	1,080 x 380 x 480	1,500 x 380 x 480
Instrument weight in kg		160	215
Testpiece weight	for testpiece table	25 kg	25 kg
	for support table	10 kg	10 kg
Electrical connection data	Instrument, PC, laser	220 (110) V; 50 Hz to 60 Hz; approx. 750 VA	
Compressed air		3 bar (0.3 MPa)	
Air consumption		≤ 4 l/min at 3 bar	
Humidity		≤ 60%	
Ambient temperature for operational readiness		+15 °C to +35 °C	

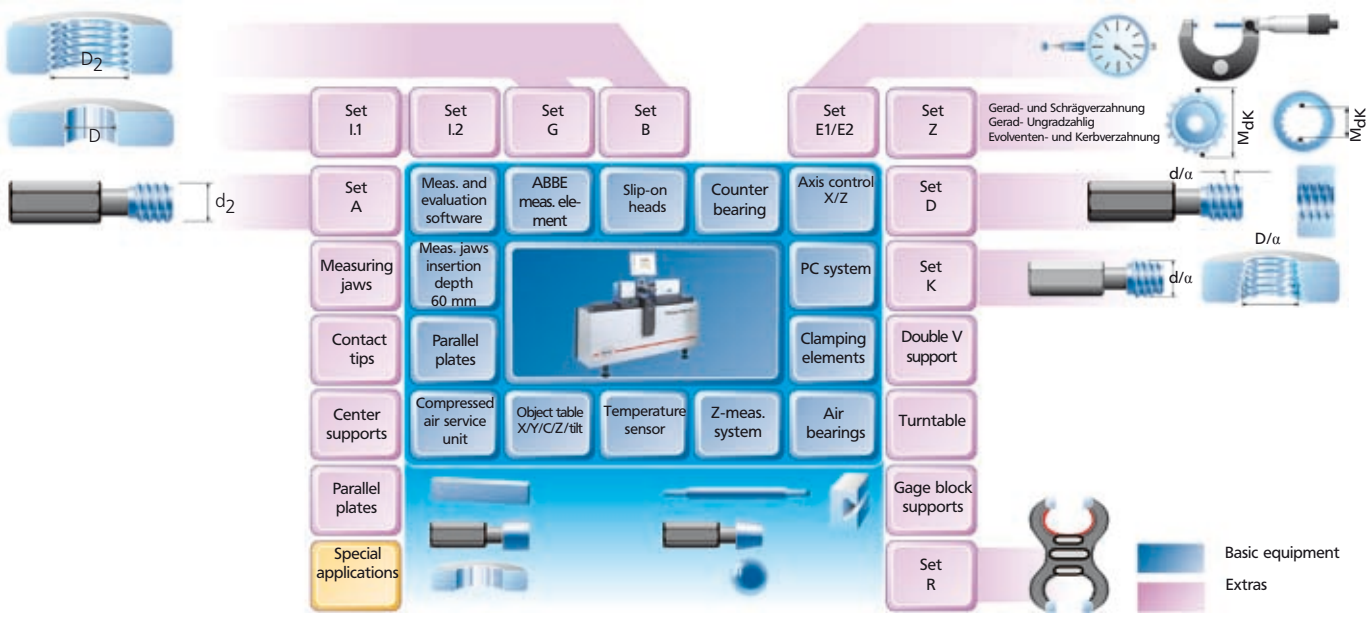
Precimar. PLM and CiM Universal Length Measuring Machines

LENGTH MEASURING MACHINES FOR HIGH-END CALIBRATION

► I Mahr's universal length measuring machines are designed for absolute and relative measurement of precision products and test equipment. Typical applications include products and test equipment for the aerospace and automotive industries, precision engineering and series testing of test equipment in calibration laboratories. With an extensive selection of products ranging from the straightforward LINEAR 100 length measuring instrument and the ULM instruments to the high-precision, semi-automated CiM universal length measuring machine, Mahr offers practical solutions for manufacturing environments, inspection rooms and calibration laboratories. In other words, high-precision metrology with extremely efficient measurement processes. I ◄



Precimar. System Overview PLM 600-2 / 828 CiM 1000



Main Applications

Calibration of

- Plain plug and ring gages
- Setting rings
- Snap gages
- Spherical gages, gages for deep bores
- Gage blocks
- Thread gages
- Taper thread gages
- Gear tooth gages
- Dial indicators
- Dial comparators
- Micrometers
- Thread pitch

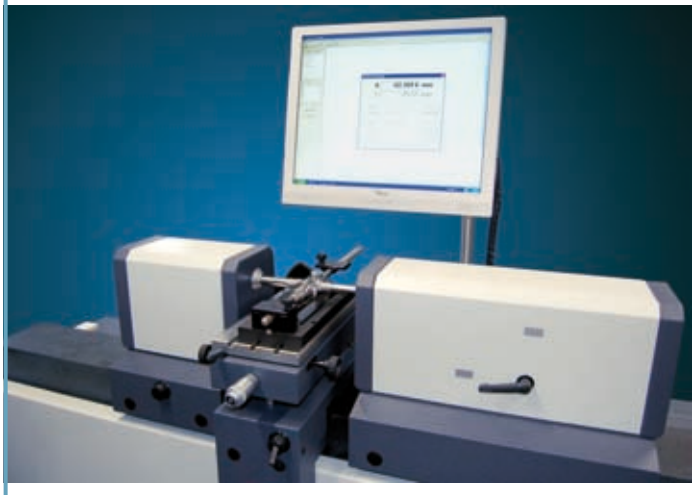
Reasons for choosing PLM 600-2 and 828 CiM 1000

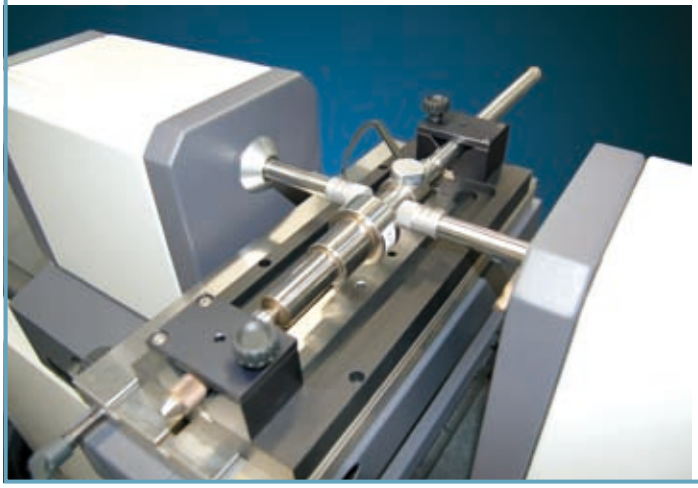
Universal Length Measuring Machines

Technical solution	User benefit
Granite	Highly homogeneous and rigid
Air bearing technology	Lower measuring uncertainty due to aerostatic bearing for measuring slide and tailstock
Online temperature monitoring	Compensation of thermic measuring deviations via software
Object table	5-axis object table with CNC control and vertical movement
Electronics	Independent recognition of outside and inside measurements
Generation of measuring force	Electronic regulation of measuring force, thus friction-free generation of measuring force and automatic contacting
Automatc drive	Measuring carriage with progressive deflection cha racteristic, automatic probe recognition, independent recognition of outside and inside measurements and computer-supported search of reversal points
Powerful MS Windows software	Maximum convenience thanks to clear and simple user navigation

Precimar PLM 600-2

Universal length measuring machine





Description

Model type
Comparator according to the Abbe principle with horizontal basic bed (highly homogeneous and rigid granite)

Measuring system

X-axis:	Incremental, high-precision Heidenhain length measuring system, 200 mm length
Z-axis:	Incremental Heidenhain illumination system, 70 mm length

Drives

X-axis:	Motor-driven measuring slide and automatic contacting
Y-axis:	Micrometer 25 mm (analog or digital)
Z-axis:	Motorized adjustment of object table (semi-automatic / CNC-controlled)

Measuring force generation
Electronically controlled measuring force generation

Operation
- Measuring spindle via joystick as well as automatic contacting
- Measuring slide and tailstock are easily positionable due to air-bearings
- Motorized height adjustment of object table using joystick or CNC-controlled

Features

- The **Precimar PLM 600-2** features a universal measuring table with 5 finely adjustable axes and 25 kg (55 lbs) load capacity, a state-of-the-art PC-based multiple-axis machine control system with PC workstation, the **828 WIN** "Free Measurement" basic software and a calibration certificate
- Straightforward operation using measuring force-controlled, joy stick-operated measuring slide, with progressive deflection characteristic and automatic contact detection
- Automatic detection of internal and external measurements and computer-aided reversing point detection
- A motorized measuring slide allows high travel speeds
- The CNC-controlled motorized vertical movement of the support table (optional) results in excellent measuring efficiency
- State-of-the-art machine control, data recording, processing, logging and transfer with powerful software and menu-driven operation
- Software compensates for thermal dimensional deviations
- Software enables very straightforward setting and changing of measuring force
- Low measuring uncertainty due to aerostatic slide ways for all measuring carriages on the machine bed
- Electronic regulation of the measuring forces and automatic contacting; therefore almost all subjective influences are eliminated and unintentional corrections with the workpiece is avoided.
- Semi-automatic bore and inside thread measurement

Precimar 828 CiM 1000

Description

Model type
Comparator according to the Abbe principle with horizontal basic bed (highly homogeneous and rigid granite)

Measuring system

X-axis:	High quality, high-precision incremental length measuring system (LIF), 300 mm length
Z-axis:	Incremental Heidenhain illumination system, 70 mm length

Drives

X-axis:	Motor-driven measuring slide and automatic contacting
Y-axis:	Micrometer 25 mm (analog or digital)
Z-axis:	motorized adjustment of object table (semi-automatic / CNC-controlled)

Measuring force generation
Electronically controlled measuring force generation

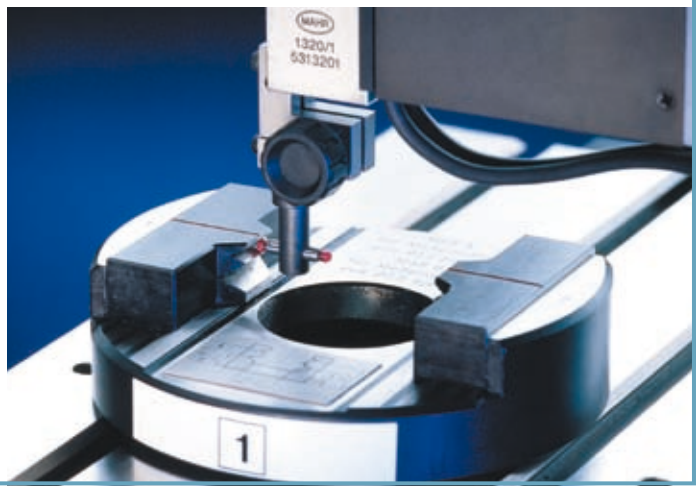
Operation
- Measuring spindle via joystick as well as automatic contacting
- Measuring slide and tailstock are easily positionable due to air-bearings
- Motorized height adjustment of object table using joystick or CNC-controlled

Features

- **Precimar 828 CIM 1000** has the highest measuring accuracy: Unique low length measuring uncertainty for precision products and gage calibration management
- 100% adherence to the comparator principle according to Ernst Abbe
- Online temperature monitoring
- Software-supported mesuring force generation, especially advanatageous for thin-walled workpieces and gage calibration devices
- Semi-automatic bore measurement and inside measurement
- High flexibility in the application range
- Numerous accessory sets and components in a modular system to solve different measuring tasks, incl. thread pitch, thread, tapered thread, toothing
- Measuring and evaluation software under MS-Windows, **828 WIN**
- Patented measuring procedure
- Minimum measuring uncertainty due to the use of aerostatic guides for all slides supported by the machine bed, the mobile bearing of the measuring spindle over a spring parallelogram which is free of both play and friction, electronic regulation of measuring forces and automatic contacting. Subjective influences are therefore minimized and unintentional collisions with the tespiece prevented

Details on metrological accessories are available on request.

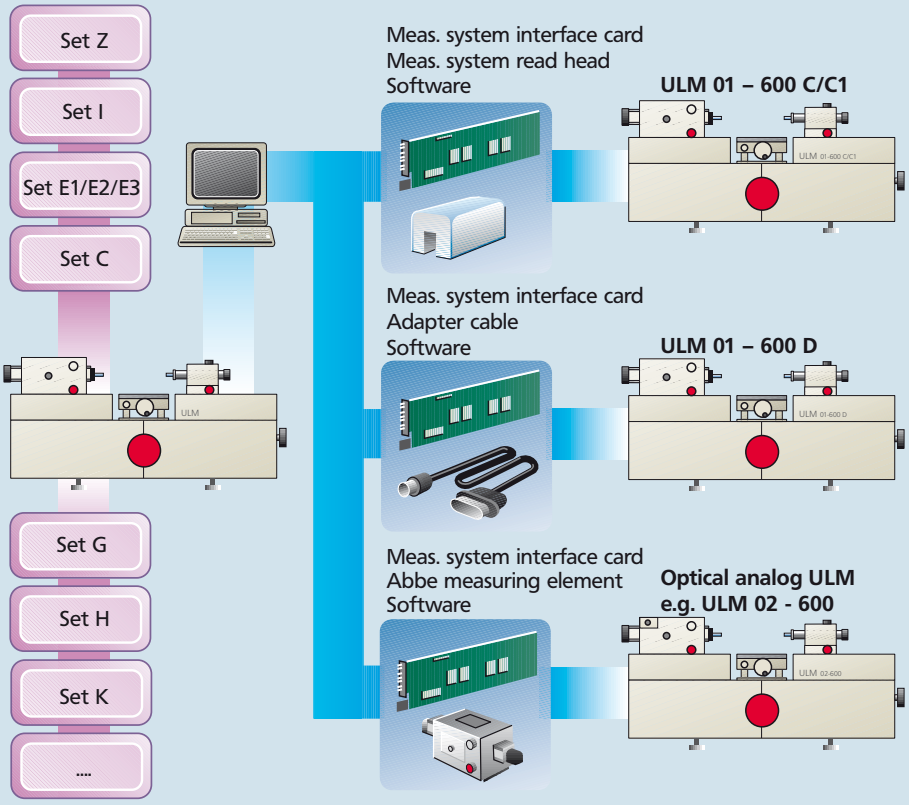
Precision length measuring machine



Precimar PLM 600-2 / CiM 1000. Technical Data

		828 CiM	PLM 600-2
Order No.		**5350013**	**5350660**
Measuring ranges (switchable mm/inch)			
External measurement	mm	0 to 1,000	0 to 600
Internal measurement	mm	0.5 to 845	0.5 to 445
Performance data			
Measuring range (incremental)	mm	300	200
Increment	µm	0.01	0.01
Measuring uncertainty MPE_{E1} (L in mm)	µm	≤ (0.055 + L/1500)	≤ (0.085 + L/1500)
Reproducibility	µm	≤ 0.03	< 0.05
Measuring forces (internal/external measurement)	N	0 to13.9, elec. monitoring	0 to 13.9, elec. monitoring
Guides		aerostatic	aerostatic
Drive (measuring slide)		motorized	motorized
Max. travel speed	mm/s	50	50
Max. contact speed with joystick	mm/s	8	8
Max. contact speed with direction buttons	mm/s	3.5	3.5
Contact speed with inductive measuring probe 1320/1	mm/s	0.6	0.6
Object table			
Table surface (length x width)	mm	150 x 350	150 x 350
Table load capacity	N	250	250
Vertical movement of Z-drive	mm	70 motorized	70 motorized
Increment Z	mm	0.01	0.01
Transverse movement Y	mm	25	25
Floating movement X	mm	± 10	± 10
Tilting movement □Y	degrees	3	3
Swivel movement □Z	degrees	8	8
Probe height (above lowest table position)	mm	70	85
Dimensions/weight (without computer etc.)			
Total length	mm	2500	1660
Total width	mm	700	700
Total height (without monitor)	mm	1700	1140
Total weight	kg	840	300
Ambient conditions			
(to ensure indicated accuracy)			
Temperature	°C	20 ± 0.5	20 ± 0.5
Temperature gradient	K/h	< 0.1	< 0.1
Humidity	%	50 to 60	50 to 60
Operating temperature	°C	15 to 35	15 to 35
Electrical connection data			
Supply voltage	V/Hz	230 V/115 V; 50/60 Hz	230 V/115 V; 50/60 Hz
Power consumption	VA	200	200
Pneumatic connection data			
(using clean compressed air free of oil and water)			
Network pressure	bar	> 4	> 4
Supply pressure	bar	3	3
Particle size	µm	< 10 (< 394)	< 10 (< 394)
Air consumption			
(depending on number of air bearings connected)	l /h	100 to 276	100 to 276

ULM. Update Options for Older ULM Models



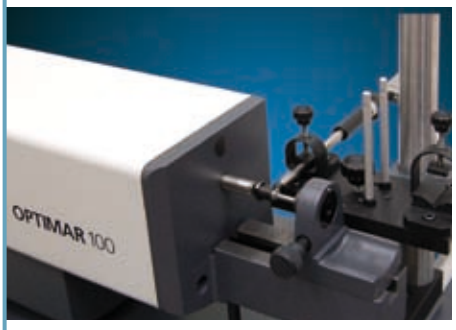
We offer users of older models of the universal length measuring instrument the opportunity to upgrade to a state-of-the-art system without going through a great deal of effort/expense.

Further update option:
Replace the bases of the following models:
ULM 02-600; ULM 01-600 D;
ULM 01-600 C; ULM 01-600 C1;
ULM 600.2; ULM 600
with a granite base
(on request).

Precimar 828. Modernization of older models

Upgrade 828 CiM-DOS to 828 CiM-WIN	**5350107**
Upgrade kit 828 CIM-DOS to CIM-WIN for Windows XP upgrade of 828 CIM-DOS machines with change of the PC-measuring card with retrofit of the roll container and the control console requires installed temperature error compensation Evaluation unit within the roll container Standard software 828 WIN "Free measuring" Language option 828 PC-WIN/CiM, German or International	**5350124**
Upgrade 828 CiM-DOS to 828 CiM (only at Mahr Göttingen) upon request	
Upgrade 828 PC DOS to 828 PC WIN Upgrade kit 828 PC-WIN for Windows XP upgrade of 828 PC-DOS machines with change of the measuring and evaluation processor PC Interface card / 828 PC-WIN with standard software 828 WIN "Free measuring" Language option 828 PC-WIN/CiM, German or International	**5350101** **5350124**
Upgrade 828 to 828 PC WIN	**Upon request**

Precimar. Software for Measurement and Gage Calibration Management GMS 100

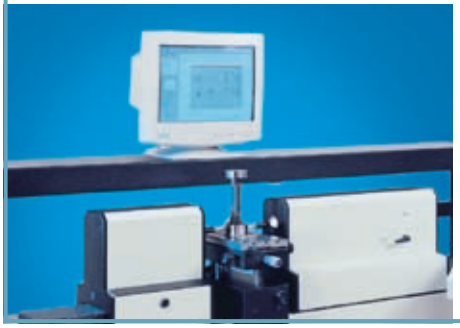


Optimar 100

826 PC

ULM

PLM 600-2



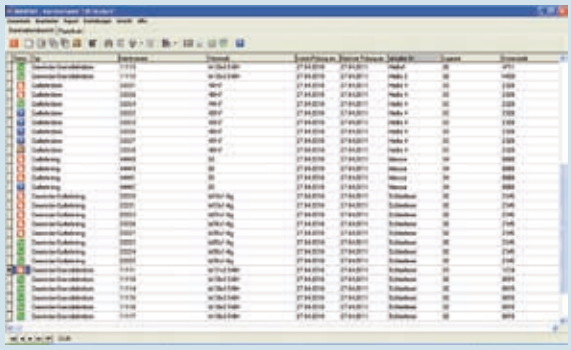
CiM

Precimar stands for dimensional metrology with the highest precision in absolute and relative measurements. Using different universal length measuring machines, lengths, outside and inside diameters, cylindrical and tapered threads, plain tapers, micrometers, snap gages, dial gages, dial indicators, probes and gage blocks as well as precision products up into the nanometer range can be reliably measured and tested with highest precision.

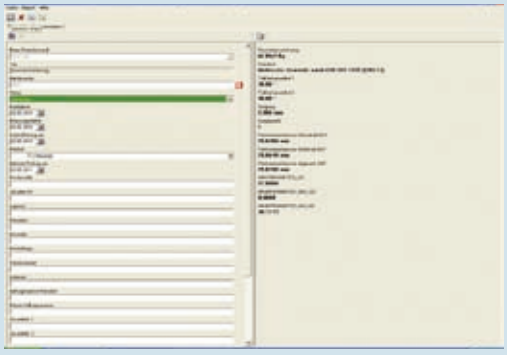
Mahr offers high-performance user-friendly Precimar GMS 100 software for gage calibration management of the gaging and measuring devices that have been tested on the Mahr measuring units in connection with the 828 WIN software of the length measuring units and the software Optimar 100.

Features

- Multi-client capability
- Creation of gage calibration card
- Documentation of the entire gage calibration history
- Sorting mode, status update as well as creation of search and reminder lists with different fliter functions.
- Automatic switching between gage calibration management and 828 WIN measuring modules or the Optimar 100 software.
- The measuring results are directly taken over into the gage calibration data bank
- Upon request: Available gage calibration data is taken over from the data bank or Excel charts that have been used so far



Gage calibration inventory GMS 100

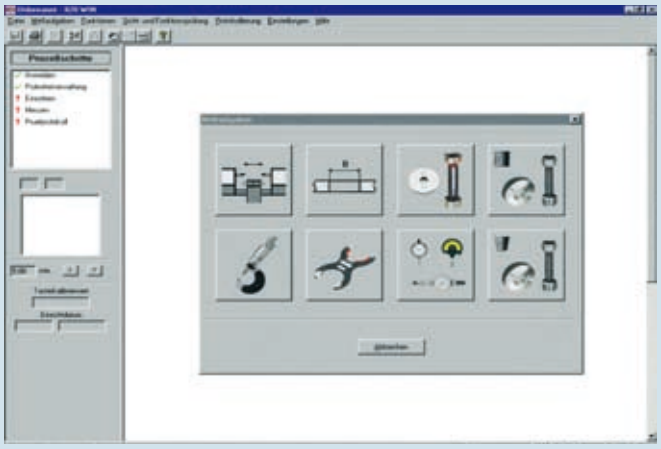


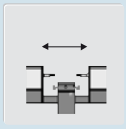
Gage calibration card

Precimar. 828 WIN Evaluation Software

Optimally combines all the features of the universal length measuring machines with the advantages of powerful computer technology and state-of-the-art software:

- Computer-aided machine control, data recording, processing, logging and transfer
- Linear and non-linear measuring system corrections
- Fully comprehensive online help in HTML format
- Reliable documentation thanks to automatic adaptation, storage and logging of all relevant measuring data
- Flexibility thanks to data transfer and incorporation in networks or QA systems
- ASCII, RS232C and DDE interfaces





Details of individual software modules:

- Values recorded in free measurement
  Order No. 5350160

- Testing of plain tapers such as plug gages and rings
  Order No. 5350161

- Testing of inside and outside threads/testing of thread plug gages and rings
- Inside thread with inductive probes
  Order No. 5350163

- Testing of tapered thread gages
  – Plugs and rings
  – ULM: Sinus table method
  Order No. 5350168

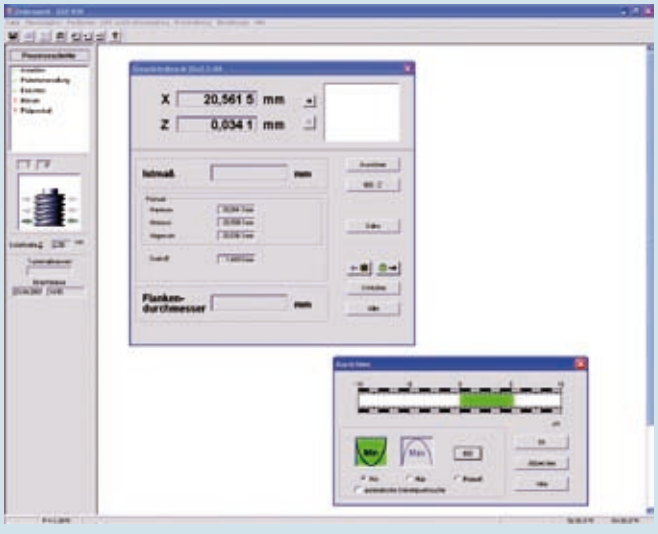
- Plain tapers (ULM)
  Order No. 5350667
- Toothing
  Order No. 5350668

- Testing of snap gages
  Order No. 5350164

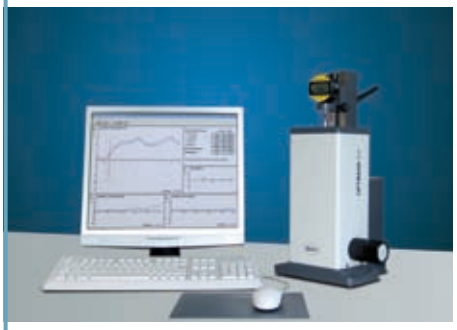
- Testing of dial gages, dial indicators, lever-type test indicators and incremental probes
  Order No. 5350166
- Gage blocks
  Order No. 5350167

Additional features:

- Nominal values and tolerances can be generated automatically after entering testpiece-specific data
- Semi-automated testing of measuring instruments
- Measuring forces can be freely selected between 0 und 12 N depending on the relevant task. The measuring forces used most frequently can be stored in a pictograph so that they are easy to call up. Electronic measuring force monitoring ensures precision and reproducibility
- Computer-aided reversing point detection. Optimum visual support for manual detection in the form of an analog bar graph

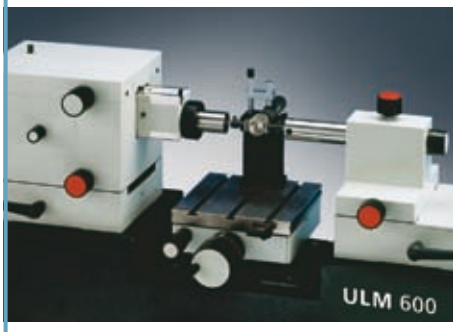


Precimar. Gage Calibration Software



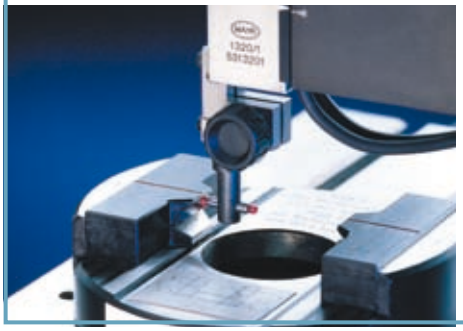
Optimar 100

826 PC



ULM

PLM



CiM

Gage Calibration with QMSOFT®

Gage calibration is an important part of a company's qualification system. Its importance is underlined by standards ISO 9000 to 9004 (EN 29000 to 29004). These standards require comprehensive periodic checking of all the company's measuring and test equipment.

QMSOFT® gage calibration consists of actual measurement and testing, comparing results with standardized nominal values (nominal/actual comparison) and a series of management activities for test equipment database maintenance.
The QMSOFT® program system is a state-of-the-art, modular software package for measuring, archiving and documenting standard test equipment such as gages, plug gages, dial indicators and snap gages.
Computer-aided operation is only effective if the computer handles at least part of all three steps in the process. In order to achieve this, QMSOFT® incorporates a large number of individual coordinated programs (QMSOFT® modules) which can be used for practical gage calibration tasks and cover the above-mentioned steps (measuring, tolerances, administration). These routines constitute the ideal complement to the length measuring instruments, gage blocks and dial indicators used for the task.

Features

- Computer-aided management (storage, archiving, evaluation) of any test equipment in a gage database; management of several independent databases is possible
- Automatic generation of nominal values (tolerance calculations) for the most common types of test equipment (e.g. plain and threaded gages etc.) in accordance with a large number of national and international standards
- Comprehensive menu support for standards-compliant measurement and a direct link between measuring instrument and computer
- Integration of management and measurement, i.e. the test results obtained can be incorporated directly into the gage database
- The system is extremely flexible and can be expanded thanks to its modular structure; customized adjustments can be made at any time

Precimar. QMSOFT 32® Software Modules

QM-MANAG 32 professional edition **Order no. 5350190**
- Provides all the functions required to manage all your measuring equipment and gages
- Used to create tool cards, search lists and reminders and to keep a complete gage history

QM-PLAIN 32 **Order no. 5350194**
- Includes the inspection routines for testing ring gages, setting rings, plugs gages and snap gages incl. GaugeCal32 Basic for plain gages

QM-THREAD 32 **Order no. 5350195**
- Inspection routines for computer-aided testing of threaded plug and ring gages, samples and threaded parts that require high-precision manufacturing
- Series of measuring data and probe constants are collected or can be determined and stored by the computer
  incl. GaugeCal32 Thread for thread gages

QM-DIAL 32 **Order no. 5350196**
- Inspection routines for computer-aided testing of dial indicators, dial comparators and lever-type test indicators

QM-CALIP 32 **Order no. 5350197**
- Inspection routines for testing calipers

QM-MICRO 32 **Order no. 5350198**
- Inspection routine for testing micrometers

QM-BLOCK 32 **Order no. 5350205**
- Inspection routine for measuring gage blocks and gage block sets, incl. QM-MANAG32 lite for the realization of data bank functions.

Installation packets, additional inspection modules and module for statistical evaluation upon request.

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Mahr

EXACTLY

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