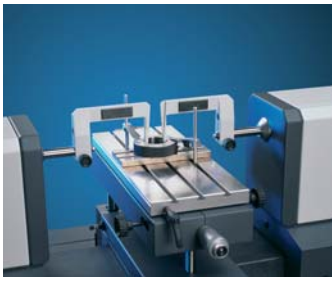
Precimar. PLM and CiM Universal Length Measuring Machines

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 PLM 600-2

Universal length measuring machines

- 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
- Minimum measuring uncertainty thanks to integral guides on the machine bed, adjustable, spring-mounted, low-friction measuring spindle, electronic measuring force control and automatic contacting
- 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.

Description

The motorized **Precimar PLM 600-2** enables user-friendly, fast and reliable measurement with minimum uncertainty. Typical applications include precision products and test equipment.

Maximum measuring accuracy is achieved thanks to single-step measured-value generation, exact compliance with the Abbe comparator principle, the high-quality incremental length measuring system and the CNC-controlled measuring carriage.

Machine bed is made of granite and is equipped with air-cushioned measuring slide with 200 mm active travel range.

828 WIN from **Mahr** or external evaluation software.

Further important features are the low – fiction measuring force generation and the CNC-controlles measuring height adjustment.

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

Versions

- **PLM 600-2** with **CNC-**controlled object table (Z-axis)

Machine for absolute and relative measurement.
Typical applications include products and test equipment for the aerospace and automotive industries and series testing of test equipment in calibration laboratories.
The machine is designed for measuring lengths, inside and outside diameters, cylindrical and conical threads, dial indicators, dial comparators, probes, long gage blocks, etc.

Accessories

- Large range of accessories for measuring
  - inside diameters (bores and rings, including large rings)
  - outside diameters (longitudinal, transverse and vertical mounting devices for use between centers as well as V-blocks)
- Huge variety of internal and external measurements thanks to numerous easily exchangeable styluses
- Fast, straightforward thread measurements on rings and mandrels thanks to semi-automated processes and a wide range of stylus balls / wires

Details on metrological accessories are available on request.

Download flyer under webcode 2380

Precimar 828 CiM 1000

Precision length metrology

Description

Superb performance, measuring runs of unique perfection and high-quality computer technology allow quality management that far exceeds the EN 29 000... / ISO 9000 guidelines.

The motorized **CiM 1000** allows user-friendly, fast, reliable measurement with uniquely low measuring uncertainty. Typical applications include precision products and test equipment.
The extremely high measuring precision is achieved using air-bearing components, practically friction-free measuring force generation, exact adherence to the Abbe comparator principle, a high-quality incremental length-measuring system and a CNC-controlled measuring slide. The machine bed is made of granite and uses an air-bearing measuring slide with a 300 mm (11.81 in) active travel range. The object table and left-hand measuring support can be moved to vary the application range from 0 mm to 1500 mm (0 to 59.06 in) mm (external measurements). The 5-axis object table allows very efficient measurement with its CNC-controlled vertical movement.

828 WIN measuring software from Mahr or external software.

Features

- **Precimar 828 CiM 1000** features a universal measuring table with 5 finely adjustable axes and 25 kg (55 lbs) load capacity, a state-of-the-art Power PC-based multiple-axis machine control system with PC workstation, the 828 WIN "Free Measurement" basic software and a calibration certificate
- Operation is simplified through measuring force-controlled, joy stick-operated measuring slide with progressive deflection characteristic, automatic contact detection, automatic detection of inter nal and external measurements and computer-aided reversing point detection
- High measuring slide travel speeds and motorized vertical move ment of the support table
- Machine control, data recording, processing, logging and transfer using powerful, menu-driven software
- 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
- Correction of systematic deviations and reduction of random deviations all result in a standard MPE_{E1} measuring uncertainty of (0.075 + L/1000) µm (L in mm). (At 20.0°C in inspection room, class 1 VDI/VDE 2627)
- Measuring force is easy to set with a software click and compensation of thermally induced dimensional deviations can be switched on and off

Versions

- **828 CiM 1000** with CNC-controlled object table (Z-axis)

Machine for absolute (up to 300 mm (11.81 in)) and high-precision relative measurement.
Typical applications include products and test equipment for the aerospace and automotive industries and series testing of test equipment in calibration laboratories.

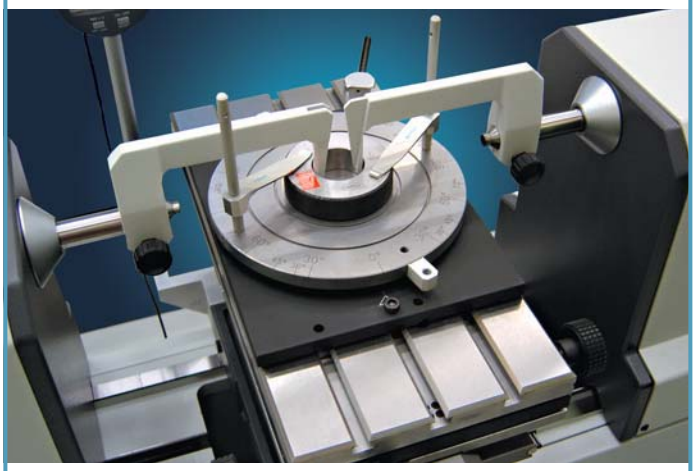
The 828 CiM 1000 is designed for measuring lengths, inside and outside diameters, cylindrical and conical threads, dial indicators, dial comparators, probes, long gage blocks, snap gages, external micrometers etc.

Accessories

- Large range of accessories for measuring
  - inside diameters (bores and rings, including large rings)
  - outside diameters (longitudinal, transverse and vertical mounting devices for use between centers as well as V-blocks)
- Huge variety of internal and external measurements thanks to numerous easily exchangeable styluses
- Fast, straightforward thread measurements on rings and mandrels thanks to semi-automated processes and a wide range of stylus balls / wires

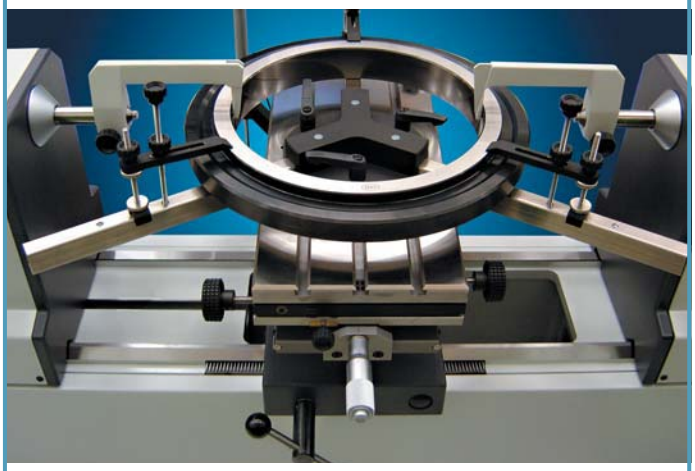
Details on metrological accessories are available on request.

CPRT 150 Rotary Table



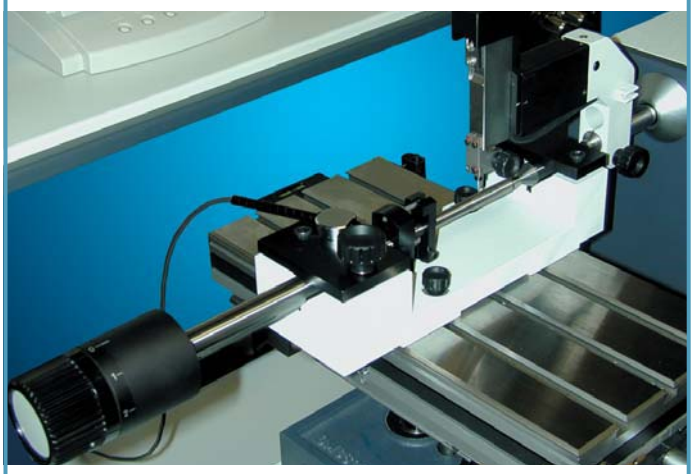
The Precimar CPRT 150 rotary table speeds up measurement of ring gages (plain and threaded) and other cylindrical items. Here the clamping and alignment process between each rotation is not necessary The Precimar CPRT 150 rotary table delivers more reliable measurements. Simplified testpiece handling during rotation reduces the likelihood of errors. Suitable for testpieces with diameters of 5 mm to 150 mm (0.20 to 5.91 in). Straightforward fitting on Mahr 828 CiM and PLM length measuring machine object tables. This means that all the table's degrees of freedom can be used.

CPRA 500 Ring Support



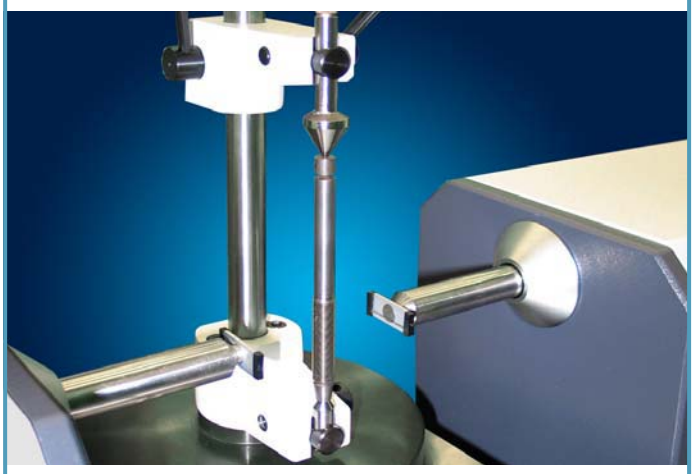
The Precimar CPRA 500 ring support allows quicker measurement of large rings (plain and threaded) and other ring-shaped items. Quick, straightforward mounting of items and rapid alignment with the measuring machine's object table. Suitable for ring-shaped testpieces with inside diameters of 250 to 500 mm (3.15 in). Optimized lightweight design with low height. Straightforward mounting on the Mahr 828 CiM and PLM length measuring machine object tables. All the object table's degrees of freedom can be used. Suitable for testpieces weighing up to 15 kg.(33 lbs)

CLS Longitudinal Center Support



The 828 CLS longitudinal center support is a special support for measuring the leads of external threads which allows quicker and simpler testpiece handling. The longitudinal center support prevents damage to your testpiece caused by clamping on the thread. In conjunction with the indicated rotation device with index plate, the 828 CLS allows the lead to be measured along a straight line. This support also allows continuous measurement over the testpiece circumference. It is suitable for testpieces up to approx. 120 mm (4.72 in) long with diameters of up to 40 mm (1.57 in).

GCA Vertical Center Support



The Precimar 828 GCA center support allows a diameter to be measured at different locations. The automatic motorized adjustment of the object table's height makes these measurements quicker and more accurate. The 40 mm (1.57 in) active measuring height makes the support suitable for testpieces of up to 80 mm (for measurement over the entire length), with a maximum clamping height of approx. 120 to 130 mm (4.72 to 5.12 in), depending on the size of the center hole. Suitable for testpieces with diameters of up to 75 mm, depending on the length of the testpiece.

Precimar PLM 600-2 / CiM 1000. Technical Data

		828 CiM	PLM 600-2
Order No.		**5350002**	**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	(0.075 + L/1500)	(0.15 + 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 φY	degrees	3	3
Swivel movement φZ	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