Mahr

Mahr® | High-Quality Measuring Solutions

Measuring Technology **for Maximum Productivity**

Mahr measurement solutions enable maximum efficiency for industrial metrology and quality control for production, measurement rooms, laboratories and research and development.

High-quality measuring solutions from Mahr ensure maximum efficiency – for quality control in production, measuring rooms, incoming goods and development.

Fifth generation family business

We are a globally operating, medium-sized family business with a focus on developing, manufacturing and selling production metrology, metering and mixing pumps and ball-bearing guides.

Our **craft**

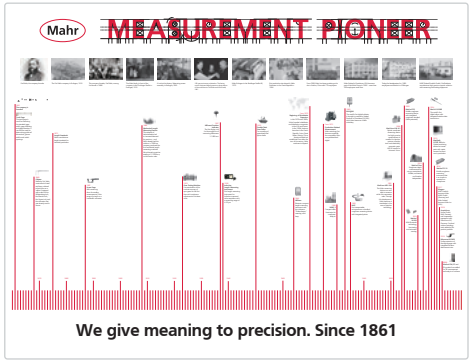
Our name is traditionally associated with quality, precision and innovation. We manufacture high-quality measuring instruments that are used for both analysis and evaluation of workpieces. In addition, high-precision gear and metering pumps and ball-bearing guides are universal mechanical design components and essential parts of our product range.

We're **up for the task**

We help our customers with their measuring tasks while raising their quality assurance to a new level. In particular, we are in touch with our customers on a regular basis and use their feedback to continuously improve our performance.

Progress through motion

Now in the fifth generation, family members and successors of company founder Carl Mahr stand firmly behind his life's work. After almost 160 years, the company continues to transform present vision into future progress, remaining a valuable and reliable partner for the industry.



We give meaning to precision. Since 1861

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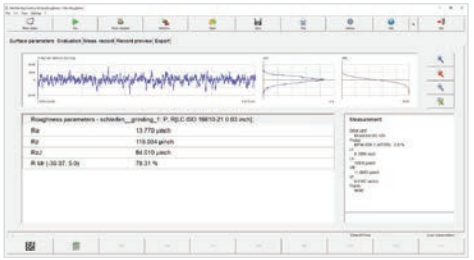
MarSurf | GD 140 / GD 280

Roughness and waviness: measuring results in record time

The MarSurf GD series includes the powerful, new reference measuring stations you can trust for roughness and waviness measurement. The instruments boast short measuring times, superb flexibility and maximum safety for machine, workpiece and user alike. Measuring stations from the MarSurf GD series deliver reliable and precise results in all types of applications and environments. Unique grid plate cross stage enables use of modular fixtures.

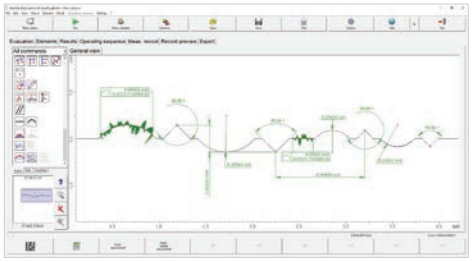


MarSurf GD 140 / GD 280	
Traversing Length	up to 140 mm or 280 mm (in X)
Positioning Speed	0.02 mm/s - 200 mm/s (in X)
Measuring Speed	Up to 10 mm/s
Operating / Analysis	Windows® 10 with MarWin EasyRoughness
Measuring Range	500 µm (±250 µm) for 45 mm probe arm length, 1500 µm (±750 µm) for 135 mm probe arm length

MarSurf | CD 140 / CD 280

Contour measurement: unprecedented precision and speed

Measuring stations from the MarSurf CD series set new standards when it comes to contour testing. Shorter measuring times, flexible applications and easy handling means greater efficiency for your quality assurance.



MarSurf CD 140 / GD 280	
Traversing Length	up to 140 mm or 280 mm (in X)
Positioning Speed	0.02 mm/s - 200 mm/s (in X)
Measuring Speed	0.02 mm/s - 10 mm/s
Operating / Analysis	Windows 10 with MarWin EasyContour
Measuring Range	70 mm (in Z with 350 mm probe arm) maximum 100 mm (with 490 mm probe arm)

MarSurf | VD 140 / VD 280

Combined contour and roughness measurement: the professional

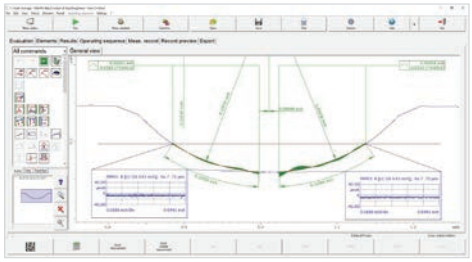
Variable Drive measuring stations from the MarSurf VD series combine contour and roughness measurements in one system. Perfect for those who want to perform a wide range of measuring tasks on one system to keep purchase costs to a minimum. The probe systems from both the MarSurf GD and CD series can be interchanged to suit the measuring task the instrument is needed for. Shorter measuring times, flexible applications and easy handling of the instruments also means greater efficiency for your quality assurance.

MarSurf VD 140 / VD 280	
Traversing Length	up to 140 mm or 280 mm (in X)
Positioning Speed	0.02 mm/s - 200 mm/s (in X)
Measuring Speed	Up to 10 mm/s
Operating / Analysis	Windows 10 with MarWin EasyRoughness and EasyContour
Measuring Range	See MarSurf GD and CD series specifications for each probe system

MarSurf | UD 130 / LD 130 / LD 260

Combined contour and surface measuring station in highest precision

The MarSurf UD/LD series utilizes a unique senor system to enable tactile surface and contour measurements in one stroke. Excellent range and ultra high resolution is available to less than 1 nm. Capable of measuring roughness on highly contoured and radiused surfaces. Typical applications are surface and contour measurements on bearing race gothic arch and precision hydraulic and fuel injection components.



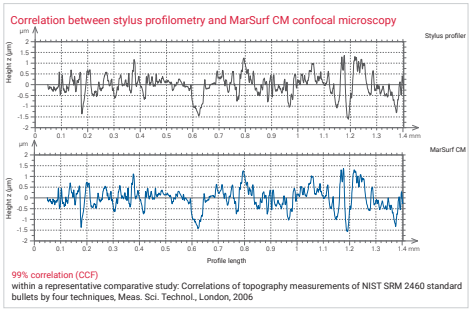
MarSurf UD 130 / LD 130 / LD260	
Traversing Length (in X)	0.1 mm up to 130 mm / 260 mm
Positioning Speed	0.02 mm/s up to 200 mm/s
Measuring Speed	0.02 mm/s - 10 mm/s
Operating / Analysis	Windows 10 with MarWin EasyRoughness and EasyContour
Measuring Range	10 mm to maximum 26 mm depending on machine version and probe arm length

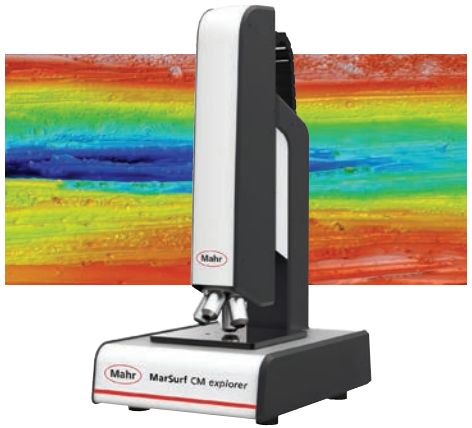
MarSurf | CM *explorer*

Flexible wide-ranging measuring solution

The MarSurf CM *explorer* is a powerful confocal microscope for fast, non-contact three-dimensional measurement and analysis of surfaces independent of material and surface conditions. The confocal method closely correlates with stylus measurements.

MarSurf CM *explorer*	
Resolution	up to 2 (nm) vertical
Measuring Speed	up to 100 fps
Measuring Principle	Confocal High-performance LED (505 nm / white)



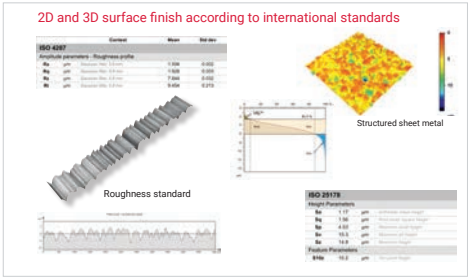


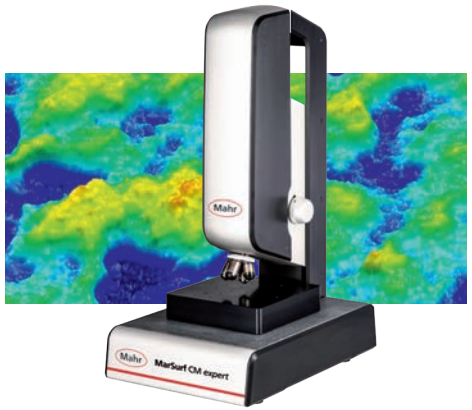
MarSurf | CM *expert*

High-performance laboratory and QA system

The MarSurf CM *expert* is a powerful confocal microscope for fast, non-contact three-dimensional measurement and analysis of surfaces independent of material and surface conditions.

MarSurf CM *expert*	
Resolution	up to 2 (nm) vertical
Measuring Speed	up to 100 fps
Measuring Principle	Confocal high-performance LED (505 nm / white)



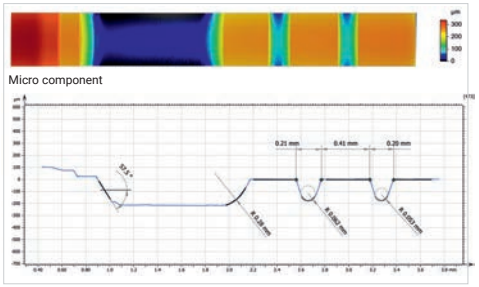


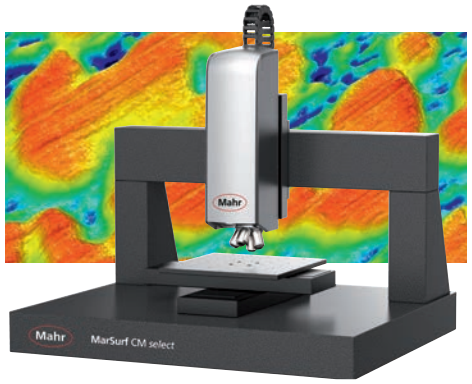
MarSurf | CM / CP / CM *select*

Measuring solution adapted to the application

The MarSurf CM *select* is a powerful confocal microscope for fast, non-contact three-dimensional measurement and analysis of surfaces independent of material and surface conditions. As a multi-sensor system, the MarSurf CM *select* offers the option of combining different sensor technologies in one measuring system. Depending on the measuring task, the optimal sensor can be selected.

MarSurf CM *select*	
Resolution	up to 2 (nm) vertical
Measuring Speed	up to 100 fps
Measuring Principle	Confocal High-performance LED (505 nm / white)





MarSurf | CM *mobile*

Flexibility to measure surface texture on large parts

This is the mobile 3D surface texture measuring instrument which is notebook pc-based for use in the production environment or on large parts or large assemblies in situ. This system enables precise and accurate non-contact surface metrology, measurement of areal parameters independent of material, and is fast and easy to use.

MarSurf CM *mobile*	
Resolution	up to 2 (nm) vertical
Measuring Speed	up to 100 fps
Measuring Principle	Confocal High-performance LED (505 nm / white)

MarForm | MMQ 100

Compact form measuring machine

The MarForm MMQ 100 formtester is the ideal solution for simple yet accurate measuring tasks such as roundness, radial runouts, or harmonic analysis (fft) close to the production area. The system is simple to install, and the proprietary mechanical bearing C-axis spindle rivals the performance of air bearing formtesters, without the need for compressed air. MarWin EasyForm is icon driven with sequences to make the choices simple for the operator to accomplish the required measurements.

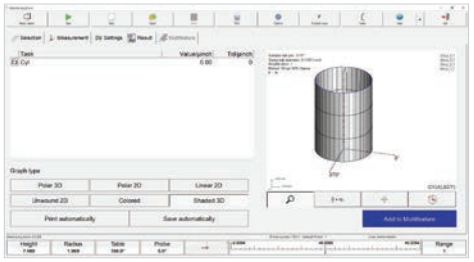
MarForm MMQ 100	
Length Horizontal Unit, X axis	1840 mm, manual
Vertical Unit, Z Axis	300 mm, manual
Centering and Tilting Table	20 kg max load, manual
Roundness Deviation	0.05 µm + 0.0006 µm/mm
Axial Runout Deviation	0.04 µm + 0.0006 µm

MarForm | MMQ 150 / MMQ 200

Compact form measuring machine

MarForm MMQ 150 – Entry-level cylindricity measuring technology. The MMQ 150 was designed for accuracy, speed and easy operation, all at a very attractive price/performance ratio. The MMQ 200 has higher precision and the option for a motorized programmable T7W probing system.

MarForm MMQ 150 / MMQ 200	
Length Horizontal Unit, X Axis	150 mm, motorized
Vertical Unit, Z Axis	250 mm, motorized
Centering and Tilting Table	20 kg max load, manual
Roundness Deviation	0.03 µm + 0.0006 µm/mm
Axial Runout Deviation	0.03 µm + 0.0006 µm/mm



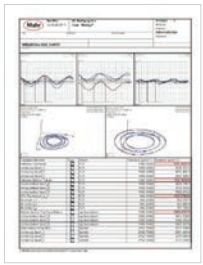
MarForm | MMQ 400 / MMQ 500

Universal form measuring machine

The MarForm MMQ 400/500 range is the flexible, fully automated solution for form and position measurements and much more. The use of extremely smooth axes and the MarWin platform software ensure that other applications, such as roughness, waviness, and contour measurements can be completed. Systems are configured with manual or automatic center and tilt alignment.

The flexibility and versatility provide a highly cost-effective measuring system which pays for itself in the shortest amount of time. The MMQ 500 adds a high load capacity centering and tilting table and faster overall performance. CNC models include motorized programmable T7W gagehead.

MarForm MMQ 400 / MMQ 500	
Horizontal Unit, X Axis	180 mm or 280 mm options available, motorized
Vertical Unit, Z Axis	350 mm, 500 mm, and 900 mm options available, motorized
Centering and Tilting Table	60 kg max load, manual or motorized options available
Roundness Deviation	0.02 µm + 0.0005 µm/mm

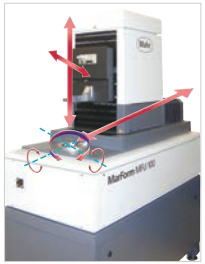


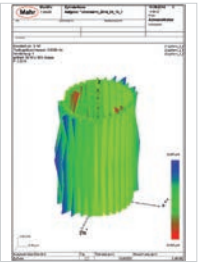
MarForm | MFU 200

The ultimate precision "reference" formtester

The MarForm MFU 200 series was developed for the world's most demanding form measurements. The system includes real time error compensation technology to ensure dynamic error sources don't influence the measurements. The Y-axis enables automatic crowning. Two options are available for diameter measurement.

MarForm MFU 200	
Horizontal Unit, X axis	190 mm, motorized
Vertical Unit, Z Axis	320 mm, motorized
Centering and Tilting Table	20 kg max load, motorized
Roundness Deviation	0.02 µm + 0.0004 µm/mm
Axial Runout Deviation	0.04 µm + 0.0005 µm/mm



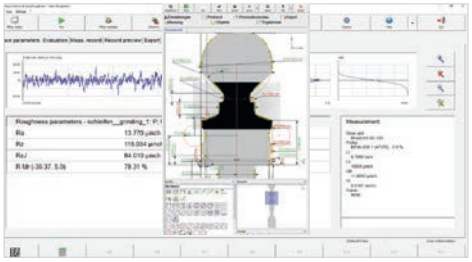


MarShaft | SCOPE 250

Universal, fully automatic optical shaft measuring system

The MarShaft SCOPE 250 from Mahr is designed for the quality assurance of small, rotationally symmetrical workpieces. Diameters, lengths, radii, chamfers and many other small features are easily measured with the matrix camera optical system and the EasyShaft software.

The proprietary C-axis mechanical bearing provides part rotation in standard or optional high accuracy (formtester) precision.



MarShaft SCOPE 250	
Measuring Range Length (Z)	250 mm
Measuring Range Diameter (X)	40 mm
Length/Diameter Resolution	0.01 mm - 0.0001 mm
Length Error Limit (Z)	≤ (3.0+L/125) L in mm
Diameter Error Limit (X)	≤ (1.5+ L/40) L in mm

MarShaft | SCOPE 350 / 750 / 1000

Universal, fully automatic, optical measuring unit

The MarShaft SCOPE *plus* is a universal, fully automatic, optical measuring unit for measuring turned parts. The MarShaft SCOPE *plus* is equipped with a precision roundness measuring axis (C), a vertical measuring axis (Z) and a horizontal measuring axis (X). The tactile probe option makes it possible to measure key way width, establish clocking from a feature, and measure on surfaces that are not visible in profile.

MarShaft SCOPE 350 / SCOPE 750 / SCOPE 1000	
Measuring Range Length (in Z)	350 mm, 750 mm, 1000 mm options available
Measuring Range Diameter (X)	80 mm or 120 mm options available
Length/Diameter Resolution	0.01 mm - 0.0001 mm
Length Error Limit (Z)	≤ (2.0+L/125) L in mm
Diameter Error Limit (X)	≤ (1.0+L/125) L in mm

MarShaft | SCOPE 600 / 850 3D

3D optical shaft measuring system

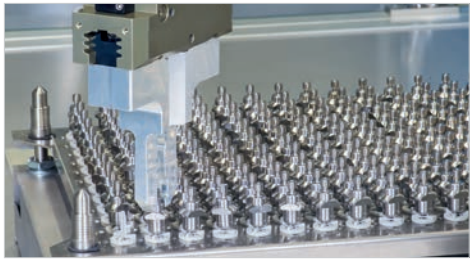
In addition to the standard measurement functions for rotationally symmetrical workpieces which can be performed with other MarShaft SCOPE systems, the 100% 3D functions of these machines can be used to also address features that were previously reserved for specialty camshaft or gear measuring machines. A unique tactile sensor enables gear and camshaft metrology.

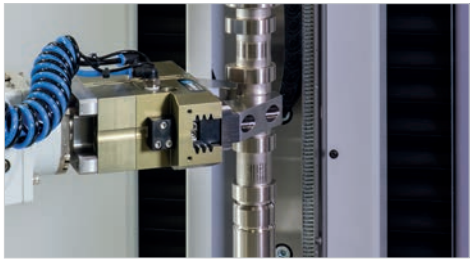
MarShaft SCOPE 600 / SCOPE 850 3D	
Measuring Range Length (Z)	600 mm or 850 mm options available
Measuring Range Diameter (X)	120 mm
Length/Diameter Resolution	0.01 mm - 0.0001 mm
Length Error Limit (Z)	(2 + L/125) L in mm
Diameter Error Limit (X)	(1.0 + L/125) L in mm

MarShaft | Automation and Combination

Intelligent measuring machine with robot loading

Custom solutions are developed combining MarShaft systems with robots, surface finish gaging, part cleaning, marking and other technologies to enable increased throughput, control and eliminate operator influence. Add closed loop feedback to annunciate defects, prompt cutting tool changes and send tool offsets.

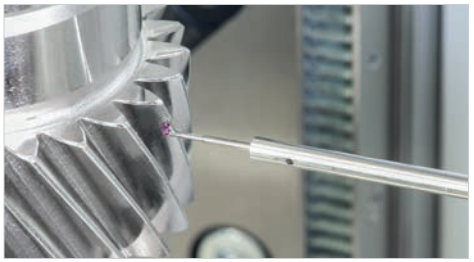




MarGear | MarShaft

3D gear measuring machine

3D optical shaft measuring system with gear metrology. In addition to the standard measurement functions for rotationally symmetrical workpieces which can be performed with other MarShaft SCOPE systems, the 100% 3D functions of these machines can be used to also address features that were previously reserved for gear measuring machines. A unique tactile sensor enables gear metrology, driven by the MarWin - MarGear software package.



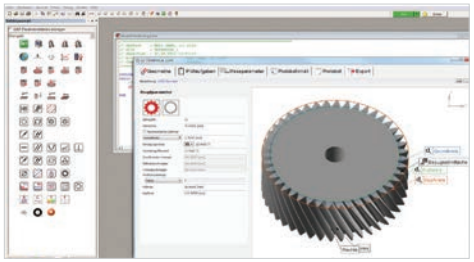
MarShaft SCOPE 600 / 850	
Measuring Range Length (Z)	600 mm or 850 mm options available
Measuring Range Diameter (X)	120 mm
Length/Diameter Resolution	0.01 mm to 0.0001 mm
Length Error Limit (Z)	(2 + L/125) L in mm
Diameter Error Limit (X)	(2 + L/125) L in mm

MarGear | GMX 275 W

Universal gear measuring center

Precise, fully automatic testing of gears and gear cutting tools up to an outer diameter of 275 mm. Combining gear measuring tasks with various form and position features has never been easier.

MarGear GMX 275 W	
Measuring Path, Motorized X	180 mm
Measuring Path, Motorized Z	320 mm
Measuring Path, Motorized Y	150 mm
Diameter Maximum	275 mm
Axial Runout Deviation	0.11 µm + 0.0008 µm/mm
Options	Tailstock, surface finish measurement

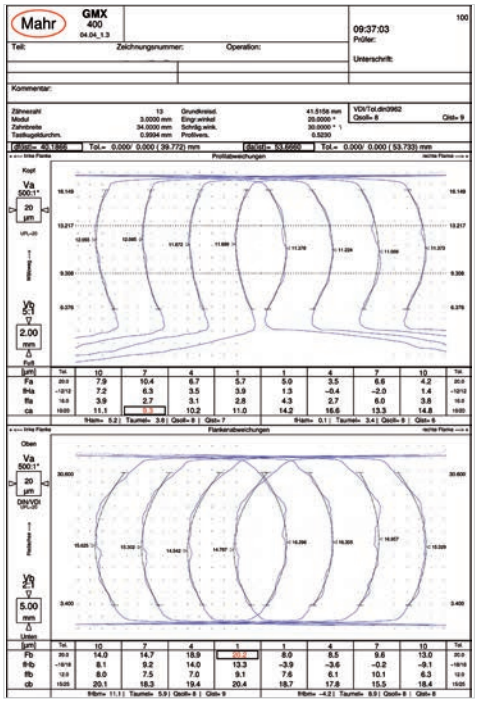


MarGear | GMX 400

Universal gear measuring center

The GMX 400 W gear and form measuring instrument can be used to determine various involute spur gears (inner and outer) and typical form and position features with a high level of accuracy. Optional skidded probe system is available for surface finish measurements with fully programmable postioning.

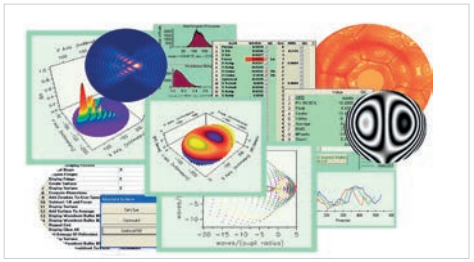
MarGear GMX 400	
Measuring Path, Motorized X	200 mm
Measuring Path, Motorized Z	320 mm
Measuring Path, Motorized Y	200 mm
Diameter Maximum	400 mm
Axial Runout Deviation	0.11 µm + 0.0008 µm/mm
Options	Tailstock, surface finish measurement



MarOpto | FI 1040 Z

Interference of light with the surface of the test specimen

The MarOpto 1040 Z is a full-featured interferometer that provides non-contact measurement of flat or spherical surfaces and transmitted wavefront of optical components and assemblies. The MarOpto1040 Z is ideal for measuring optical components such as flats, prisms, lenses, gauge blocks or precision metal parts such as bearings, sealing surfaces, contact lens molds, or polished ceramics.

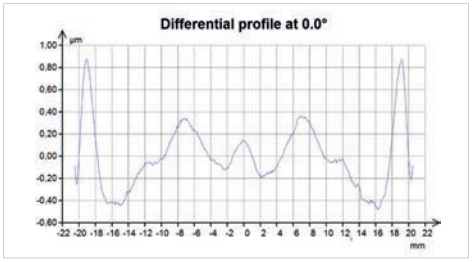


MarOpto FI 1040 Z	
Source	632.8 nm HeNe Laser
Camera	640x480 Analog
Measuring Principle	Fizeau interferometry, interference of light with the surface of the test specimen
Options	Vertical, horizontal workstations or stand alone

MarSurf | LD Aspheric 2D

Form and contour measurement

Minimal probe force tactile contour measuring machine for 2D measurement of spheres, aspheres, and DOE.

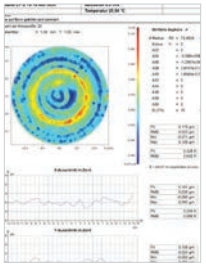


	MarSurf LD Aspheric 2D
Resolution	0.8 nm
Measuring Speed	0.02 mm/s to 200 mm/s
Measuring Principle	Tactile based on interferential-optical sensor
Traversing Length	130 mm or 260 mm
Options	Freestanding and bench top models

MarSurf | Aspheric 3D

High precision 3D station

Minimal probe force tactile contour measuring machine for 3D measurement of spheres, aspheres, and DOE.

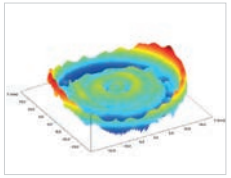


MarSurf Aspheric 3D	
Resolution	0.8 nm
Measuring Speed	0.02 mm/s to 200 mm/s
Measuring Principle	Tactile based on interferential-optical sensor, rotating C-axis
Traversing Length	130 mm or 260 mm
Options	Workholding fixtures

MarOpto | MFU 200 3D

Precision 3D measuring station

This highly flexible machine uses non-contact methods to measure rotationally and non-rotationally symmetric parts; including freeforms, off-axis and cylinders.

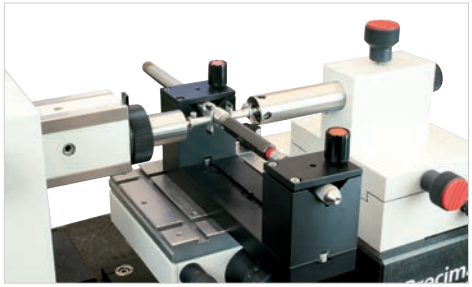


MarOpto MFU 200 3D	
Table Load Capacity	200 N
Measuring Speed, Z Axis	0.1 mm/s to 50 mm/s
Positioning Speed, Z Axis	0.1 mm/s to 50 mm/s
Maximum Part Diameter	180 mm
Options	Optical and tactile sensors, AnyShape

Precimar | ULM 300 / ULM 600 / ULM 1000

Calibration measuring instruments

Universal length measuring instrument with 100 mm direct measuring range. Accessories to suit requirements for calibration of master rings, master discs, threads, and more.



Precimar ULM 300 / ULM 600 / ULM 1000	
Measuring Range for Outer Measurement	0 mm to 1025 mm
Measuring Range for Inner Measurement	0.5 mm to 870 mm
MPE	≤ (0.09+L/2,000) µm
Options	OD thread, inside thread, spline

Precimar | 130B-16 / 130B-24

Gage block comparator

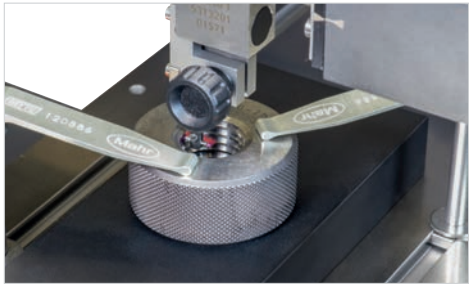
The 130B-24 and 130B-16 gage block measuring instruments from Mahr are the first choice for many large calibration laboratories. These systems are designed only for comparative measurements of gage blocks.

Precimar 130B-16 / 130B-24	
Application Range	0.25 mm to 600 mm depending on model
Direct Measuring Range	± 0.38 mm
Repeatability	< 0.025 µm
Options	Accessories for preparing gage blocks for measurement

Precimar | PLM 600-E / 828 CiM

Precision length measuring machine

The PLM-E precision length measuring machine is an Ernst Abbe-compliant comparator with horizontal machine base (highly homogeneous, rigid granite).

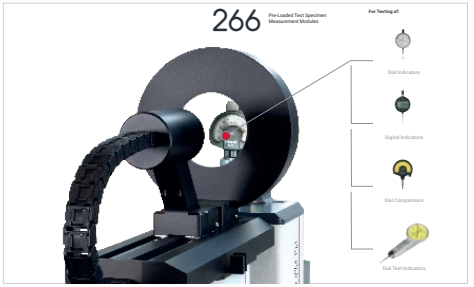


Precimar PLM 600-E / 828 CiM	
Measuring Range for Outer Measurement	0 mm to 1000 mm depending on model
Measuring Range for Inner Measurement	0.5 mm to 850 mm depending on model
MPE	≤ (0.055 + L/1500) µm depending on model
Options	OD thread, inside thread, spline

Precimar | ICM 100 IP

Fully automated dial indicator test bench

You can use the Precimar ICM 100 IP to automatically and cost-effectively test dial indicators and dial comparators. Easy handling with one hand and the clever software ensure the test device is the perfect solution for measuring rooms, calibration labs and production testing.



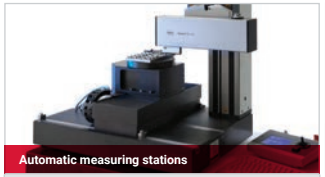
Precimar ICM 100 IP	
Digital Numerical Increment	0.02 µm
Measuring Uncertainty MPEE1 (L in mm)	≤ (0.2 + L/250) µm
Mass	45 kg
Options	Staging accessories for various types of gages to be calibrated

Engineered Solutions | Contour and surface

Manual measuring stations

Positioning and recurring measuring tasks made easy

- Targeted and simple organization of the processing of individual measuring tasks
- Easy handling of large and heavy workpieces
- Efficient processing of recurring measuring tasks, e g. work sequence plans



Automatic measuring stations

Automated measuring sequences without tying up personnel

- No operator influence on measuring results
- No staff need to be involved during measurement
- Automation and high-precision metrology combined across the entire measurement circuit
- High quality design for 24/7 operation

Fully automatic measuring stations

Insert workpieces, start measurement and get results

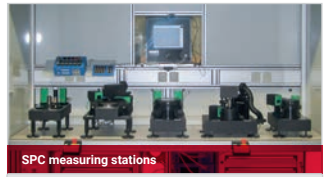
- Fully automatic inline processing of numerous and complex measuring tasks without staff involvement
- All-in-one measuring station: Automatic workpiece recognition and selection of measuring program, probe arm, etc.
- High-quality design for 24/7 operation in production
- Operation by workshop personnel

Engineered Solutions | Dimensional metrology

OEM solutions

Measuring modules for inline integration

- Targeted and simple organization of the processing of individual measuring tasks
- Easy handling of large and heavy workpieces
- Efficient processing of recurring measuring tasks, e g. work sequence plans



SPC measuring stations

Turnkey solutions for different measuring tasks

- No operator influence on measuring results
- No staff need to be involved during measurement
- Automation and high-precision metrology combined across the entire measurement circuit
- High quality design for 24/7 operation

Manual solutions

Manual loading and measurement

- Measure directly in production
- Simplest handling
- Measuring result is available within a few seconds
- Reliable and safe measurement by workshop personnel

Engineered Solutions | Automation

Automatic measuring stations

Measurement without staff involvement

- Fully automatic processing of multiple and complex measuring tasks
- Combination of several measuring sensors into one measuring station
- Automated measuring room
- Operation without metrology personnel

Inline solutions

Measuring stations for inline integration

- Complete measuring stations with workpiece feeding and output
- Automated workpiece handling in the measuring station
- Automatic workpiece recognition and measuring program selection
- Fully automatic measurement

Complete inline solutions

Measuring station with peripherals

- Workpiece feeding and alignment
- Workpiece classification laser marking of the workpiece
- Bulk material feeder
- Inspection tasks such as crack detection and much more

Engineered Solutions | Custom accessories

Special probe arms

- For Mahr products from the areas of form and location measurement as well as contour and roughness metrology
- Avoid probe arm changes
- Make complex and hard-to-reach measuring points accessible

Clamps

- High-precision clamps for form and position measurement
- Solution from the metrology specialist for clamping devices as part of the measurement circuit

Workpiece holders

- Holders with quick-change principle, for fast, easy and reliable setup
- Holders for pallet measurement
- Easily set up complex workpieces for demanding measuring tasks

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