Measuring system MFU 200: one machine – **two ultra precise versions**

The proven Mahr MFU measuring system is available in two versions for different applications: MFU 200 for testing form and position of rotationally symmetrical workpieces and MFU 200-3D for measuring components in the optical industry.

MFU has stood for accuracy and stability for many years. Thanks to its universality and ultraprecision it has qualified as a highly precise reference measuring system. The highest measuring certainty increases the tolerance margin for production, optimizes processes, and ultimately reduces production costs.

Advantages of the MFU 200

- High precision thanks to nanometer machine accuracy for workpiece tolerances of 0.5 µm
- Simple to operate providing fast and simple access to the measuring result in just a few seconds – even for a new workpiece
- User-friendly software platform MarWin for form, gear, contour, shaft, roughness – learn once, apply again and again.
- Future-proof thanks to software upgrade options: lead, roughness, contour, chatter marks, Capto, commutators

Additional advantages of the MFU 200-3D

- Equipped with optical IPS sensor and MarOpto clamp set for the qualification of spheres, aspheres, and freeforms in the optical industry
- Clear and user-friendly software platform AsphericLib for measuring and evaluating spheres and aspheres
- Measure freefroms flexibly with the clearly laid-out Aspheric Lib software platform and evaluate them using the Anyshape software
- Optimum performance: Form deviations <100 nm (PV) in 2D and 3D

Maximum precision

The MFU 200 concept ensures accuracy in the nanometer range.

Most reliable repeatability

With an absolute positioning accuracy of 0.001 mm within the space, this provides the best possible reproducibility and process capability.

Measurements without user intervention

The fully automated measuring process with motorized centering and tilting means that user intervention is no longer required thus ensuring process stability.

Shorter measuring times

The high-speed C-axis accelerates the measurements considerably thus increasing productivity.

High-performance checks

The motorized T7W measuring probe and the probe arms arranged in the shape of a star combined tacitly and optically with the IPS sensor allows for flexible scanning and user-friendly operation.

MFU 200

Reference form measuring station

DESCRIPTION

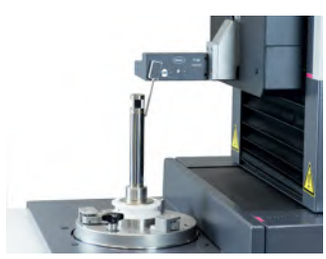
- Reference form measuring station in a new dimension
- The journey from high precision measuring axes to competent measurements is often a long one that the **MFU 200** has mastered completely. Only the **MFU 200** has integrated reference elements for the real-time spatial compensation of geometric deviations, recording all profiles as high precision 3D coordinates.
- For decades, **MarForm** measuring machines have been recognized for their accuracy and stability. The new **MFU 200** was developed with the claims of testing the shape and position features of product parts in a one liter measuring volume close to the production area and at a reasonable cost. In doing so, it has taken our long experience into a new dimension.
- **MFU 200** is a precision reference form measuring center. Its exceptionally low measurement uncertainty increases the tolerance margin for your production processes, thereby lowering production costs.

The form measuring center consists of the following components:

- Circular roundness measuring axis (C)
- Motorized centering and tilting table (X, Y, A, B)
- Roundness measuring axis circular (C- high-speed, up to 200 U/min)
- Vertical straightness measuring axis (Z)
- Horizontal straightness measuring axis (X)
- Tangential multifunction axis (Y)
- Motorized length measuring probe T7W
- MarWin Evaluation Software for form and position features
- The consistent separation of control and evaluation makes **MFU 200** future-proof and expandable. New language versions can be implemented just as effectively as special evaluations and new standards. The **MFU 200** is also already prepared for the use of optical sensor technology, the MarForm IPS, and can thus also measure micro surface structures with high precision.
- In short: **MFU 200** brings form measuring machines for inspection rooms and production areas into a new dimension.

TECHNICAL DATA

Order no.	5440580
Type	MFU 200
Monitor	19" TFT monitor (touchscreen monitor)
Control panel	MCP 12
Motorized measuring probe	T7W
Probe arm	60 mm ø 1.0, ruby, M2, 60 degrees, prepared for the connection of the optical sensor IPS15
Pitch error	Pitch error of the C-/Z-/X-axis is calibrated



APPLICATIONS

- Checking product parts for form and position features
- Roundness, concentricity / coaxiality, cylindricity, concentricity, axial runout, axial runout, total runout, straightness, parallelism, squareness, inclination, flatness, conicity, diameter, taper, Fourier analysis (waviness analysis), line profile, area profile, cam shape
- Recording of all profiles as high-precision 3D coordinates with real-time
- Spatial compensation of geometric deviations
- Scanning of surfaces, roughness evaluation
- Scanning and evaluation of contours and shapes

MFU 200

Reference form measuring station

ACCESSORIES

Order no.	Description
	Hardware (mandatory position)::
9028023	Calibration sphere Ø 15 mm with Mahr calibration certificate
9064901	with MarWin PC with WINDOWS 10, multi-lingual
3026857	Wireless keyboard K400 plus Logitec, German
3026858	Wireless keyboard K400 plus Logitec, English
6710620	Three-jaw chuck with flange, Ø 100 mm (NEW VERSION!). not to be used with basic holder
3017216	Basic holder for quick clamp/retriever interface
9004831	Rim chuck with three jaws, Ø 50 with column and flange for MFU quick clamp
	Software (optional/mandatory position):
5480312	ProfessionalForm software
5480311	AdvancedForm software
	Optical sensor for MFU 200 plus:
5400275	Interferometric controller with IPS15, including rack to hold the IPS box

Three-jaw chuck with column

Calibration sphere

Rim chuck

Rim chuck with collet chucks

For more information, please visit our website: www.mahr.com

MFU 200-3D

High-precision 3D measuring station for spheres, aspheres and freeforms

DESCRIPTION

- The **MFU 200-3D** is a universal, highly accurate measuring machine for the automatic measurement of spheres. aspheres, freeforms. and special lenses and was developed by Mahr to enable optical components to be tested quickly in 2D and 3D close to the production area.

Accuracy

- With a measurement uncertainty of less than 100 nm PV, the measuring instrument is perfectly designed to meet your process optimization requirements.

Flexibility

- The **MFU 200-3D** can perform optical and tactile measurements of surfaces. An interferometric point sensor is used for the optical measurement. There is a wide range of probe arms for tactile measurements. Rotationally symmetrical objects with a kurtosis of up to 45°, off-axis and freeforms up to 28° can be measured.

TECHNICAL DATA

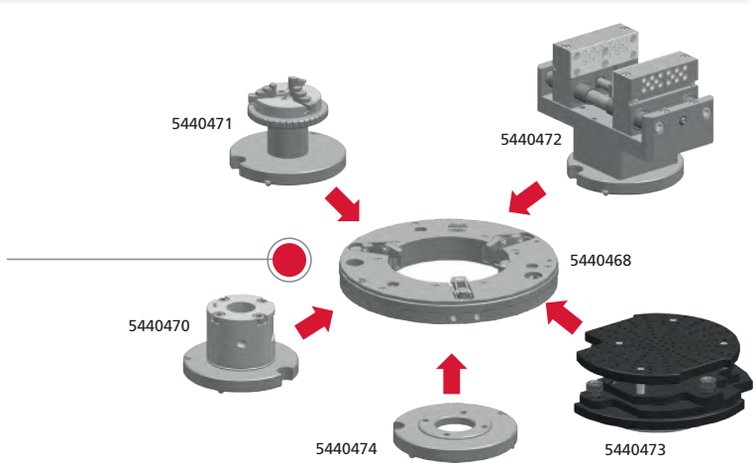
Order no.	5440581
Type	MFU 200-3D
Monitor	19" TFT monitor (touchscreen monitor)
Control panel	MCP 12
Motorized measuring probe	T7W
Optical measuring probe	IPS
Probe arm	90° angled, ruby ball ø 3mm, incl. connection for optical sensor
Pitch error	Pitch error of the C-/Z-/X-axis is calibrated
Calibration set and Basic clamp set	included
MFU 200-3D Aspheric software package	included
MFU 200-3D Anyshape software option	optional

ACCESSORIES

Order no.	Description
5440468	Hydraulic expansion chuck ø 25 mm for quick clamp system
5440471	Three-jaw chuck for quick clamp system
5440472	Vise for quick clamp system
5440473	Index plate for quick clamp system
5440474	Mounting plate
3028108	Adapter for hydraulic expansion chuck 25 mm – 12 mm
9058047	Clamps for 200 mm lenses

Clamp set

Universal design for every purpose – the design ensures you are well equipped even if you have a broad range of components.



MFU 200-3D

High-precision 3D measuring station for spheres, aspheres and freeforms

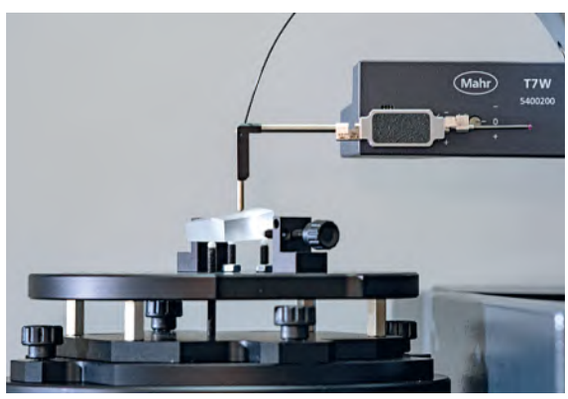
Advantages:

- Automatic tilting and centering – user-independent positioning, centering, and alignment of measuring objects
- Active tracking – automatic measurement of unknown geometries; the sensor (optical and tactile) automatically follows the surface via the machine controller
- Probe combination – combination of optical sensors and tactile probes can be combined in one probe system; can be moved in space (360°)
- Closed loop integration in the production process (grinding/polishing) perfect for transmissive optics (tilt/centering error designation)

MEASURING TASKS & SOFTWARE

Flexible measuring tasks in one machine

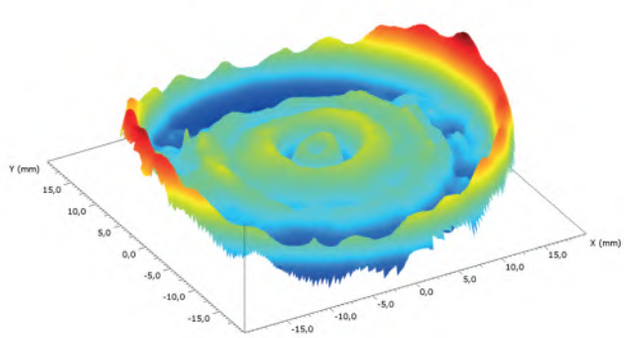
- Form
- Contour
- Roughness
- Axis offset of lenses
- Radial runout error
- Tilt and centering error of the optics



SOFTWARE

Special software package for your requirements

- AsphericLib software for measuring and evaluating spheres and aspheres
- SW analysis of the tool for the future – freeform measurement and evaluation



For more information, please visit our website: www.mahr.com

Mahr GmbH
Carl-Mahr-Straße 1
37073 Göttingen
Germany

Reutlinger Straße 48
73728 Esslingen
Germany

Tel.: +49 551 7073 800
info@mahr.com
www.mahr.com

3765844 | 04.2022