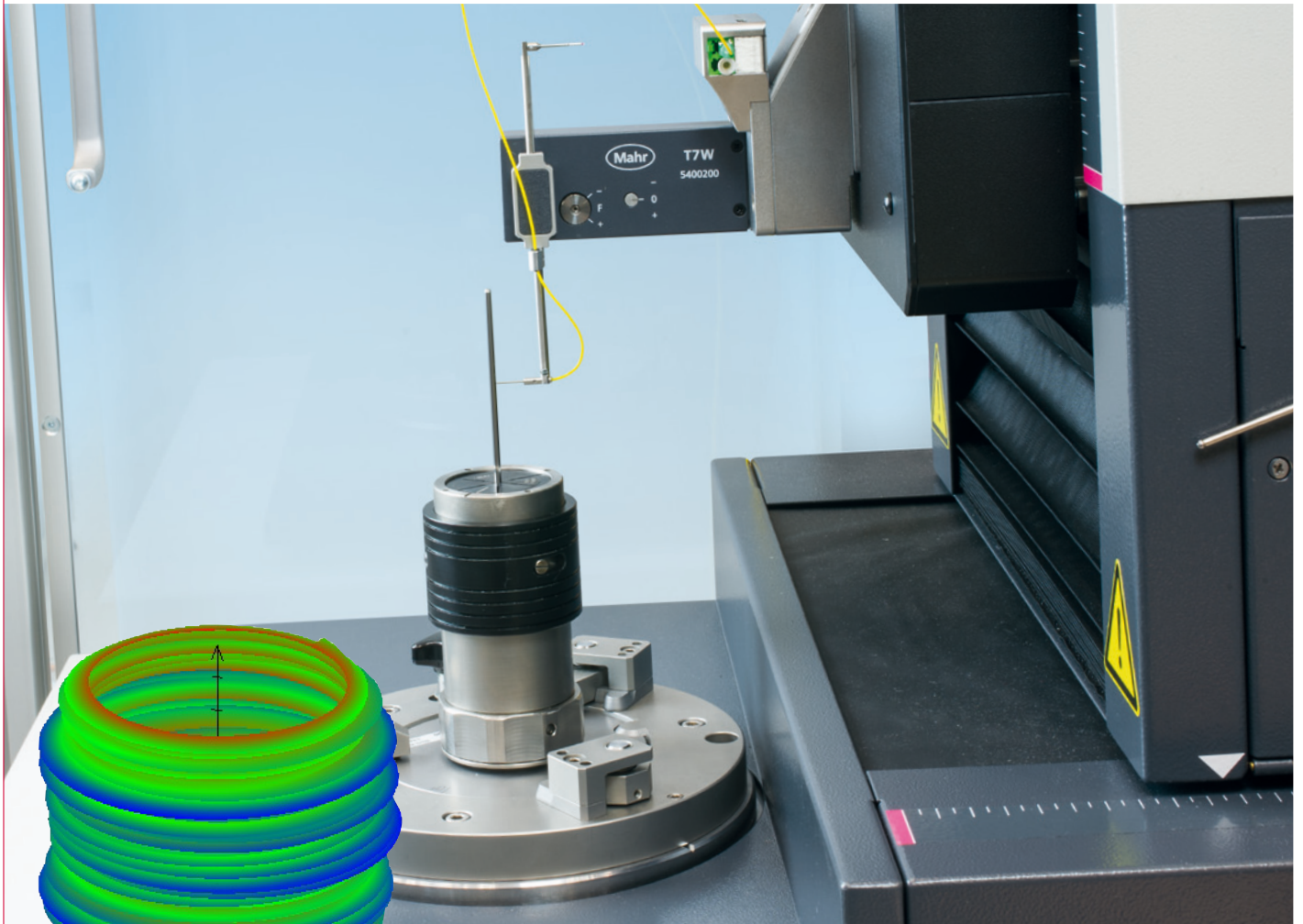


MarForm



MarForm MFU 110 with Optical Sensor IPS 15

New: Non-contact
measurement of the form
and roughness tolerances
with optical probe

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Mahr

EXACTLY

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Description

MarForm IPS 15 and MarForm MFU 110 – optical, non-contact and wear-free measurement of form and position tolerances.

For a long time, universal measurements of form and position tolerances were possible as highly accurate reference measurements only with tactile sensors. Solutions offered by the market were usually specially created solutions for a very specific task. The disadvantage of this was the very limited universality and very high capital expenditure.

Mahr as a manufacturer of high-precision sensor systems, measuring machines and measuring devices has taken on the task of combining highly accurate form metrology with optical sensors, in which the price/performance ratio is particularly positive through an excess of accuracy and measuring speed:

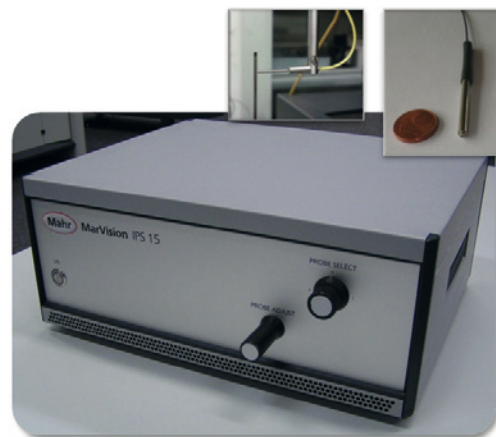
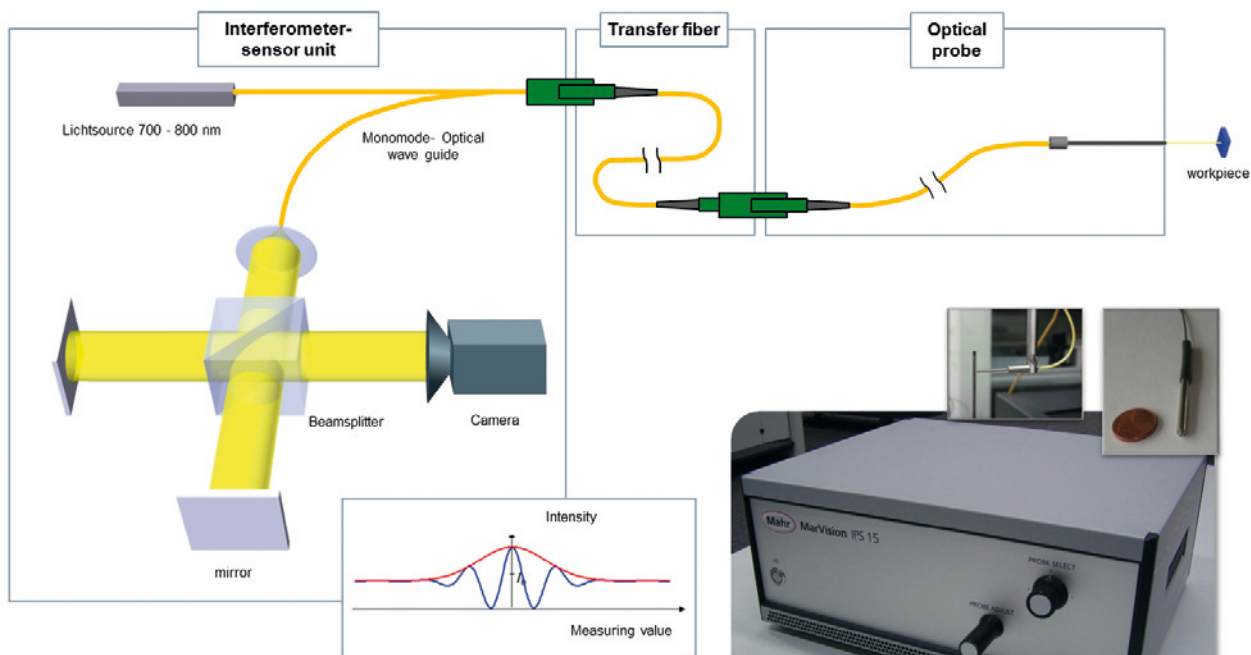
New: Roughness is also measurable

The MarForm IPS (**IPS = Interferometric Point Sensor**), together with the MarForm MFU 110 offers the possibility to measure and evaluate workpiece surfaces impressively quickly with up to 200 U/min¹ to instead of the standard 5 U/min¹. The resolution of the IPS sensor in the sub-nanometer range and excellent signal quality can therefore also evaluate fine waviness without re-measuring. This spares you additional measurement time and additional costs.

Functional description

The interferometric point sensor IPS 15 is based on the principle of white light interferometry (WLI). The WLI is an optical measurement method in which light of low coherence length is used to generate a unique and highly precise measurement result.

IPS 15 is composed of the IPS sensor box and an optical probe, which are connected to one another via optical waveguides. The interferometer forms an interference signal - the interferogram (gray-scale image of the interference) - on the detector. From the interferogram, distance values are calculated via a patented, multi-stage evaluation algorithm. Thus, measurements with a high resolution in the sub-nanometer range are possible.



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Features

Combined optical and tactile tracing:

The optical probe can be used as a probe arm for the motorized probe system T7W in the form measuring machines MarForm MFU 100 / MFU 110/200 MFU. Combinations of optical and tactile sensors in a T7W probe arm unit are also possible in order to even further increase the universality of the possible applications.

Fast measurements:

The interferometric sensor point IPS 15 enables rapid detection of dot-shaped 3-D geometry data. With its high-speed C-axis of up to 200 U/min¹, the MarForm MFU 110 offers the corresponding measuring machine. As a cylinder coordinate measuring machine, the MarForm MFU together with the measurement and analysis software MarWin offers a complete 3D data acquisition and three-dimensional analysis of shape variations, i.e. of form and position tolerances.

Wear-free measurement with neutral measuring force:

The interferometric point sensor IPS 15 is particularly suitable for non-contact measurements that are force-free and wear-free of flat or curved measuring objects made of materials that would deform or change if measured with a mechanical switch.

New measuring possibilities:

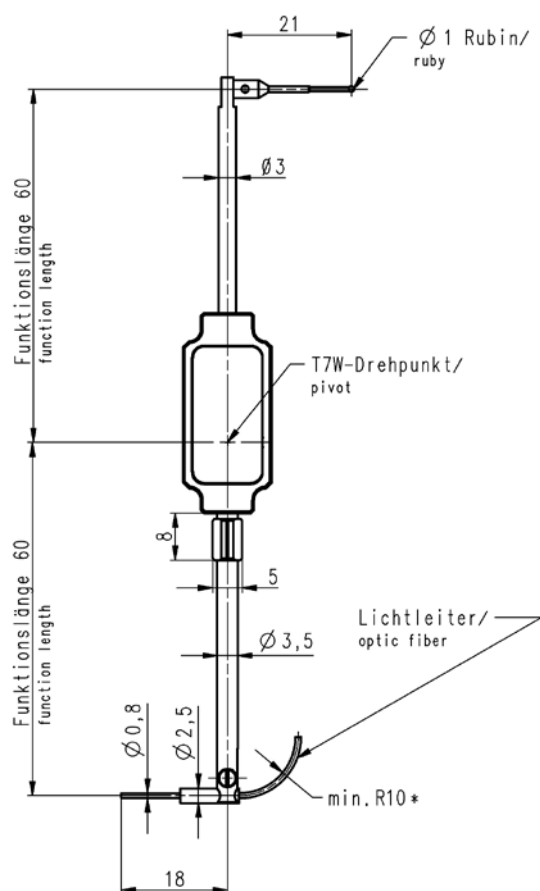
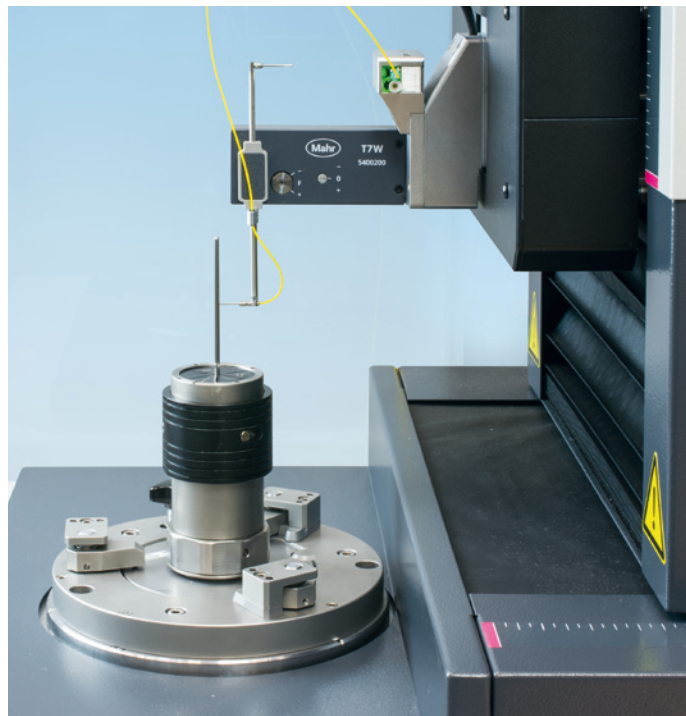
Surfaces of elastically deformable material (e.g. thin films, rubberized surfaces, thin-walled cylinders) can also be measured. In addition, the non-contact measurement is especially advantageous with high hardness materials such as ceramic and diamond because increased wear occurs on the mechanical touch probes in a tactile measurement.

Thanks to the small dimensions of the optical probe, the interferometric point sensor IPS 15 can be used even with unfavorable workpiece geometries.

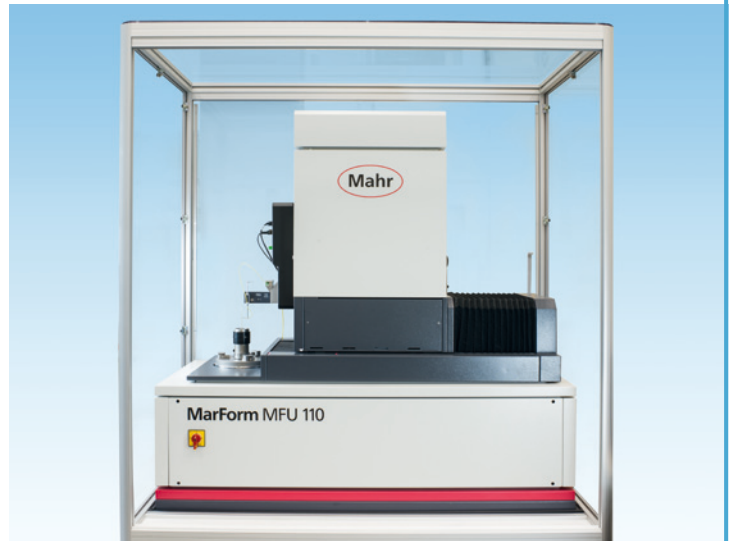
Highest demands:

Typical measuring objects for form measurements with an interferometric point sensor are highly accurate production parts that are tolerated with manufacturing tolerances of less than 1 micron. Complying with tolerances in the 1 micron range in manufacturing and exploiting them only partially, already places a high demand.

To check these tolerances with the measurement uncertainty of one tenth of a fraction of 1 micro there are the MarForm MFU machines, now also with the interferometric point sensor IPS 15.



MarForm MFU 110 with Optical Sensor IPS 15



MarForm IPS 15. Technical Data

Measuring value	relative distance
Metrology	Fizeau and Michelson interferometers
Signal processing	digital
Scanning frequency	6 kHz
Resolution of display	< 1 nm
Digital resolution	< 0.1 nm
Absolute measuring range SNA	+/- 25 μm
Limit angle SNA	+/- 3 °
Absolute measuring range HNA	+/- 5 μm
Limit angle HNA	+/- 20 °
Spot size (depending on probe, focusing)	typically 1 μm - 3 μm
Working distance	< 0.5 mm
Probe arm diameter (depending on probe)	approx. 0.6 mm - 3 mm
Laser class	class 1M, infrared
Operating temperatures without air-conditioned cabin with air-conditioned cabin	20 °C, 20 °C to 35 °C
Relative humidity	max. 70%, non-condensing
Dimensions (W x H x D)	450 mm x 190 mm x 420 mm
Weight	14 kg
Power supply, Power consumption	90 VAC - 264 VAC, 50 Hz, 25 W
Protection class	IP2

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