

LaserTRACER

The measurement system for complete recording of volumetric deviation on machine tools and coordinate measuring machines

Don't be satisfied with less!



Target group

Our customers are machine-, device- and controller manufacturers, retrofit providers and users of machine tools and coordinate measuring machines.

Innovation

Using the **LaserTRACER** considerably simplifies recording of geometric error in measurement and production machines with a high level of accuracy.

When combined with the TRAC-CAL software, high-precision machines can be calibrated within a short space of time. Positional deviations, straightness deviations, yaw-, roll- and pitch errors are all determined to sub-micrometre accuracy.

Unlike conventional systems, the **LaserTRACER** has a patented process which gives it unprecedented turning accuracy. This allows highly accurate length measurements in space.

Function

Within the **LaserTRACERS**, there is a high-precision fixed reflector ball with form deviation of less than 50 nm. This is used as a reference mirror for the interferometer. It is mechanically and thermally disconnected from the setpoint tracing mechanism and remains stable to a sub-micrometre range even when it moves. This completely eliminates guide errors for rotating and swivel axis.

The interferometer has a resolution of 1 nm at a maximum measurement length of 15 m and largely compensates for differences in ambient conditions using built-in temperature-, pressure- and humidity sensors. The laser light is fed through a glass fibre, which minimises thermal strain on the measurement instrument and also allows a highly compact design. The **LaserTRACER** can easily be operated by a single person, even in a confined space.

Spatial measurement with sub-micrometre accuracy

Area of application:

- Monitoring and calibration of high-precision measuring machines and machine tools
- Multi-iteration system for high-precision measurement tasks
- 3D real-time multi-iteration system with sub-micrometer resolution by combining 4 LaserTRACER systems
- High-precision recording of spatial points using MULTITRACE option in TRAC-CAL 3.0
- Volumetric compensation of machine tools and coordinate measuring machines
- Calibration of parallel kinematics
- Vibration measurement and analyses on machines and devices
- High precision robot calibration
- Wireless ballbar test with up to 15 m measurement radius for quick checks on machine tools and for rule optimisation on CNC controllers

Specifications

Dimensions and weight	
Weight LaserTRACER	approx. 11,5 kg
Weight electronic unit	approx. 10kg
Height LaserTRACER	200mm
Height reference ball above table surface	165mm
Working area	
Angle range for swivel axis	-18° bis +85°
Angle range for rotating axis	± 200°
Measurement range	0,2 - 15m
Angle range for reflexor (catseye)	120° (15m) / 160° (2,5m)
Dynamics	
Maximum reflector acceleration	3 m/s ²
Maximum reflector speed	5 m/min
Accuracy	
Laser frequency stability 24h	2 x 10 ⁻⁸
Reference ball stability at ΔT = ±1K	± 0,1μm
Interferometer resolution	0,001μm
Length measurement	$U_{(k=2)} = 0,2\mu\text{m} + 0,3\mu\text{m/m}$

AfM
Accuracy for Machines

AfM Technology GmbH
Gartenstraße 133
73430 Aalen
Germany

Fon +49 (0) 73 61 88 96 08-0
Fax +49 (0) 73 61 88 96 08-99
www.afm-tec.com
info@afm-tec.com