

LASERTRACER

▶ SPATIAL MEASUREMENTS WITH SUB-MICRON ACCURACY



The use of the LaserTRACER improves the calibration of measuring instruments and machine tools dramatically.

In combination with the software TRAC-CAL machines of highest accuracy can be calibrated extremely fast, simple and accurate. Position, straightness, squareness, pitch, yaw and roll of all axes can be determined with sub-micrometer accuracy.

In contrast to conventional laser-trackers the LaserTRACER offers an outstanding accuracy of the centre of rotation by a patented reference sphere. Therefore length measurements in space can be carried out with ultra high precision.

- ▶ THE LASERTRACER IS THE IDEAL INSTRUMENT FOR THE CALIBRATION AND MONITORING OF MEASURING MACHINES AND MACHINES TOOLS IN COMBINATION WITH OUR SOFTWARE SOLUTIONS TRAC-CAL AND TRAC-CHECK.

eTALON

APPLIED TRACEABILITY

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FUNCTIONAL PRINCIPLE

Inside the LaserTRACER is a fixed high-precision sphere with a form deviation of less than 50 nm is mounted. This sphere serves as reference reflector for the interferometer. In addition, the sphere is mechanically and thermally decoupled from the tracking mechanism. As the result, the sphere remains stable in the sub-micron range during the movement of the tracking mechanism and the guiding errors of the horizontal and elevation rotation axis are completely eliminated.



The interferometer has a resolution of 1 nm at a maximum range of 15 m. The influence of the environmental conditions is compensated by implemented temperature, pressure and humidity sensors. The laser tube is located in the external control box and guided to the LaserTRACER by a glass fibre. Therefore the thermal load is greatly reduced and a compact design can be provided. The LaserTRACER can be handled by a single operator and is applicable to machines of all working volumes.

APPLICATION AREAS

- ▶ Calibration and monitoring of high-precision CMMs and machines tools
- ▶ Multilateration systems for high-precision measuring tasks
- ▶ High-precision calibration of robotics

SPECIFICATION

Weights and dimensions	
LaserTRACER weight	approx. 12 kg
Controller weight	approx. 10 kg
LaserTRACER height	200 mm
Height of reference sphere above machine table	165 mm
Operating range	
Angular range elevation axis	- 18 ° up to + 80 °
Angular range azimuth axis	± 200 °
Measuring range	0.2 m up to 15 m
Angular range reflector (cateye)	120 °
Environmental temperature for accuracy specification	15 °C – 35 °C
Dynamics	
Maximal permissible acceleration of the reflector	3 m / s ²
Maximal permissible velocity of the reflector	5 m / min
Accuracy	
Frequency stability laser 24 h	2 · 10 ⁻⁸
Stability of the reference sphere at ΔT = ±1 K	± 0.1 μm
Resolution interferometer	0,001 μm
Spatial displacement measurements	U _(k=2) = 0.2 μm + 0.3 μm/m