Difference
Laser Interferometer

SP-DI Series

SIOS
Meßtechnik GmbH

Design and Operation

SP-DI Series diifferential interferometers are used for highly precise differential length and angle measurement.

The strictly symmetrical optical structure of the interferometer achieves extremely high long-term stability of the length measurement.

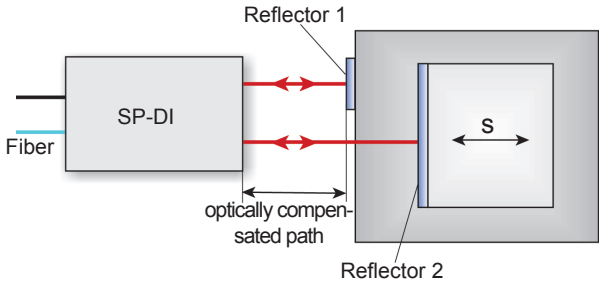
Two parallel beams detect the relative motion between a reference point and the measuring point with the highest resolution and precision. The beam distance calibrated in the factory enables angles to be measured with high precision.

The measured values are recorded and displayed on a PC with optional data acquisition and display software.

Major Performance Features

- Differential length and angle measurement with the highest accuracy
- Sensor head is made of stainless steel as standard
- High long-term stability
- Differential measurement minimizes environmental effects
- Easy adjustment and handling
- HeNe laser with high frequency stability as the metrological standard
- Fiber-optic coupling of the sensor head
- Correction of environmental influences on the wavelength of the laser light
- Open interfaces for OEM software under Windows and Linux
- Other beam distances are possible

Operating Principle



Applications

- Highly precise differential length measurements, for example on positioning systems, for long-term material investigations and in dilatometry
- Angles and tilts are measured with the greatest accuracy by calibrating the beam distance
- Optional vacuum-compatible designs

Technical Data	Model SP 2000 DI
Measurement range	2000 mm
Resolution	5 pm
Laser waverlength	632.8 nm
Frequency stability of the HeNe laser (after warm-up time)	≤ $2 \cdot 10^{-8}$
Warm-up time of the HeNe laser	10...20 min
Beam distance (standard)	21 mm
Angular measurement range	±1.5 arcmin
Angular resolution at 0.1 nm length resolution	0.001 arcsec
Operating temperature range	15...30 °C
Maximum displacement speed of the measuring reflector	800 mm/s
Dimensions (L x W x H) Sensor head with base plate Electronic supply and evaluation unit	 180 mm x 140 mm x 43 mm 450 mm x 400 mm x 150 mm
Mass Sensor head with base plate Electronic supply and evaluation unit	 3.3 kg ca 8 kg
Interfaces standard optional	RS232C, USB Digital 32-bit parallel interface Digital incremental signals (TTL level) Analog incremental signals ($1V_{PP}$)
Cable length between sensor head and electronics unit	3 m, optionally up to 10 m
Line voltage / frequency	100...240 VAC /47...60 Hz
Laser safety class according to EN 60825-1:2014 and ANSI Z136.1 (CDRH)	2M II

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