# Difference Plane-Mirror Interferometer


## SP-DI Series

SIOS Meßtechnik GmbH

## Design and Operation

Series SP-DI diifference 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.

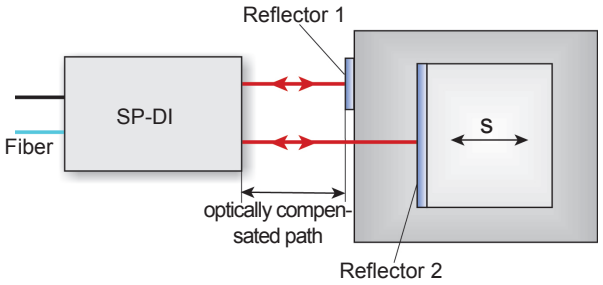
Two parallel beams detect the relative motion between a reference point and the measuring point with the highest resolution and precision. The beam distance calibrated in the factory enables angles to be measured with high precision.

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

## Major Performance Features

- Difference length and angle measurement with the highest accuracy
- Sensor head is made of stainless steel as standard
- High long-term stability
- Difference 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 120 DI* | Model SP 2000 DI |
|---|---|---|---|
| Measurement range | mm | 70 | 2000 |
| Resolution | pm | 20 | 20 |
| Laser waverlength | nm | 632.8 | 632.8 |
| Frequency stability of the HeNe laser (after warm-up time) | | ≤ $3 \cdot 10^{-7}$ | ≤ $2 \cdot 10^{-8}$ |
| Warm-up time of the HeNe laser | min | 1 | 10...20 |
| Beam distance (standard) | mm | 21 | |
| Angular measurement range | arcmin | ±1.5 | |
| Angular resolution at 0.1 nm length resolution | arcsec | 0.001 | |
| Operating temperature range | °C | 15...30 | |
| Maximum displacement speed of the measuring reflector | mm/s | 800 | |
| Dimensions (L x W x H)<br>Sensor head with base plate<br>Electronic supply and evaluation unit | <br>mm<br>mm | <br>180 x 140 x 43<br>150 x 450 x 400 | |
| Mass<br>Sensor head with base plate<br>Electronic supply and evaluation unit | <br>kg<br>kg | <br>3.3<br>ca 8 | |
| Interfaces standard<br>optional | | RS232C, USB<br>Digital 32-bit parallel interface<br>Digital incremental signals (TTL level)<br>Analog incremental signals ($1V_{PP}$) | |
| Cable length between sensor head and electronics unit | m | 3, optionally up to 10 | |
| Line voltage / frequency | VAC/Hz | 100...240 /47...60 | |
| Laser safety class according to EN 60825-1:2007 and ANSI Z136.1 (CDRH) | | 2M<br>II | |

*For ultra-stable measurements we recommend the model SP 2000 DI due to higher frequency stability of the HeNe laser.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