Differential Plane-Mirror Interferometer

SP-DIS Series

SIOS
Meßtechnik GmbH

Design and Operation

SP-DIS series diifferential interferometers with plane-mirror reflectors are precision length measuring instruments. They can be adapted geometrically and functionally to specific tasks. The miniaturized sensor head enables the application as permanently installed measuring system.

Not only plane mirrors and other optical-quality surfaces but also tilt-invariant reflectors, such as ball and hollow reflectors, may be used as reflectors. The laser light is transmitted to the sensor head through fiber-optic cables.

The miniature interferometer converts the change in distance of the parallel measuring surfaces into an interference signal. This interferometric signal, is transmitted to the supply and evaluation unit, and output as a length value. Operation and display take place on a PC with optional data acquisition and display software.

Major Performance Features

- Flexible, ultraprecise length measuring system
- Adaptable to specific customer requirements
- Single-beam measuring principle minimizes Abbe errors
- Plane mirrors and also tilt-invariant reflectors suitable
- The measured object can also be moved perpendicularly to the direction of measurement according on the size of the reflecting surface
- Fiber-optic coupling of the sensor head
- No thermal effects on the measurement environment
- HeNe laser with high frequency stability as the metrological standard
- Correction of environmental influences on the wavelength of the laser light
- Open interfaces for OEM software under Windows and Linux

Operating Principle

Measured value $s = s_1 + s_2$

Applications

- Measurement and calibration of mirror surfaces
- Extensive position insensitivity of the sensor head
- Parallelism measurements
- Measurement compared to a fixed reference point

Technical Data		Model SP 2000 DIS
Measurement range (Maximum distance of the reflectors)	mm	2000
Resolution	pm	20
Laser waverlength	nm	632.8
Frequency stability of the HeNe laser (after warm-up time)		$\leq 2 \cdot 10^{-8}$
Warm-up time of the HeNe laser	min	10...20
Operating temperature range	°C	15...30
Maximum displacement speed of the measuring reflector	mm/s	800
Dimensions (L x W x H) Sensor head Electronic supply and evaluation unit	 mm mm	 75 x 75 x 36 450 x 400 x 150
Mass Sensor head Electronic supply and evaluation unit	 g kg	 200 ca 8
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	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 II

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Warning:

We reserve the right to alter products and their specifications without prior notice.