
Double-Beam Plane-Mirror Interferometer



SP-DS Series

Design and Operation

Double-beam plane-mirror interferometers of the SP-DS series allow a wide variety of applications as OEM measuring systems or standalone units.

Two parallel measuring beams are used to acquire two length values independently of each other and with maximal resolution and precision. Difference values or angle values may be calculated from this and the factory-calibrated beam spacing.

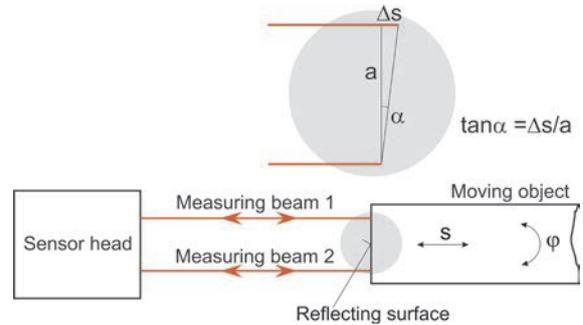
The single-beam measuring principle applied to every measuring beam allows measuring set-ups in compliance with the Abbé principle which avoids first-order measurement errors.



Major Performance Features

- Simultaneous length and angle measurement or differential measurement with maximal accuracy
- Easy adjustment and handling using an alignment base
- HeNe laser provides a light source with a high frequency stability
- Fiber coupling of laser light
- Correction of environmental influences
- Selectable materials of sensor head: aluminium, stainless steel or Invar
- Measurement software as well as support for OEM software for Windows and Linux

Operating Principle



Applications

- OEM measuring system for laser-interferometric precision length measurement and calibration of coordinate and length measuring machines, machine tools, measuring and positioning tables
- Differential measurement, e.g. materials testing, dilatometry or deflection and creep behaviour investigations
- Simultaneous length and angle measurements of positioning stages or for machine calibration

Technical Data		Model SP 120 DS	Model SP 2000 DS
Length measuring range	mm	70	2000
Resolution	nm	0.1	0.1
Laser wavelength	nm	632.8	632.8
Frequency stability of the HeNe laser (after warm-up period)		$\leq 3 \cdot 10^{-7}$	$\leq 2 \cdot 10^{-8}$
Warm-up period of the HeNe laser	min	1	10...20
Beam separation (standard)	mm	4 / 12.5 / 25.4	
Angular measuring range	arcmin	± 1.5	
Angular resolution at 0.1 nm length resolution			
Beam separation: 4 mm	arcsec	0.005	
Beam separation: 12.5 mm	arcsec	0.002	
Beam separation: 25.4 mm	arcsec	0.001	
Operating temperature range	$^{\circ}\text{C}$	15...30	
Maximum moving mirror translation rate	mm/s	800	
Interfaces standard optional		RS232C, USB Digital 32-bit parallel interface Digital incremental signals (TTL level) Analog incremental signals (1V _{pp})	
Size [L x W x H] / mass of sensor head with adjustable mount		depending on design and material, in this case Al:	
Beam separation: 4 mm	mm / kg	165 x 110 x 57 / 1.6	
Beam separation: 12.5 mm	mm / kg	161 x 125 x 54 / 1.8	
Beam separation: 25.4 mm	mm / kg	160 x 140 x 54 / 1.9	
Size [L x W x H] / mass of electronics unit	mm / kg	450 x 400 x 150 / 8	
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 / ANSI Z136.1 (CDRH)		2M / II	

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Warning:

