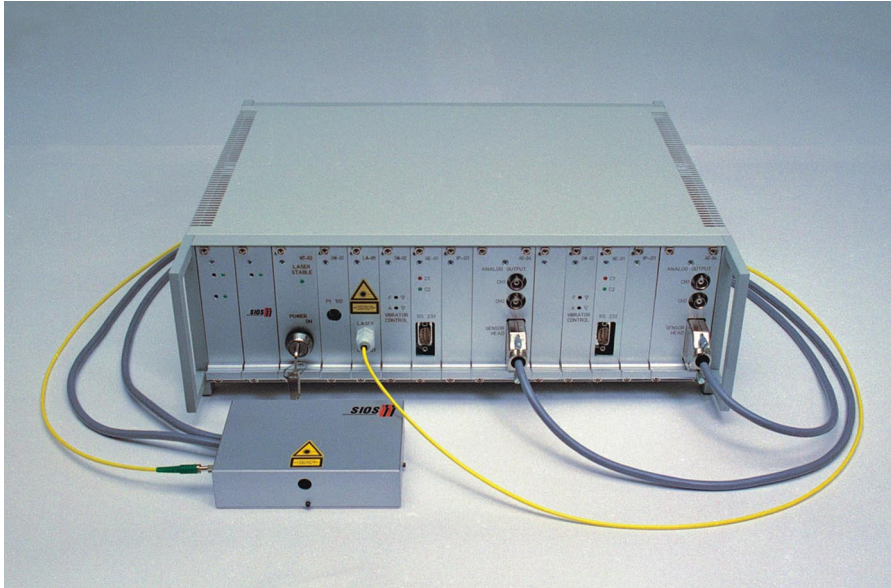


## **SP-D series miniature double plane mirror interferometer**



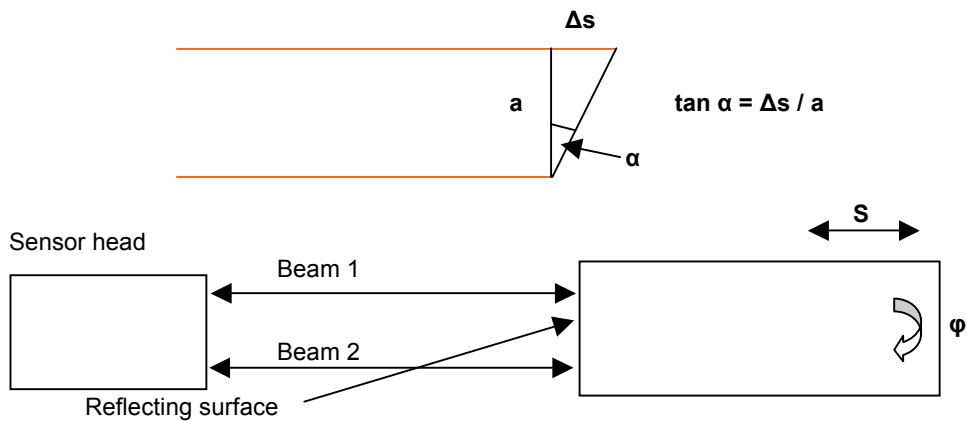
The SP-D double plane mirror interferometers are designed for incorporation into customer-supplied systems, and are used for simultaneously making pairs of nanoprecision length measurements. The difference between the pair of length measurements and the separation between the two beams are then used to accurately determine the associated angles involved, where the angular measurement range is approximately two minutes of arc, independent of beam separation. In cases involving small length changes, focussing the beams onto the objects being measured allows an increase in the angular measurement range to  $\pm 30$  minutes of arc.

The laser light sources are coupled to the sensor heads via a fibre optic connection. The miniature interferometers convert motions of the moving mirrors into pairs of optical-interference signals that are transmitted to the optoelectronic signal processing/power supply unit for processing. The HeNe lasers (frequency stabilised on models designed for making longer length measurements) are corrected for wavelength shift due to environmental factors and allow very high metric precision. A PC running custom software is employed for operating the electronics modules and displaying the measurement results.

### **Applications:**

- Making measurements on plane tables, microscope stages, positioning systems, coordinate-measuring machines or machine tools
- Correction of angular error on dual-axis and multi-axis coordinate-measuring machines
- Measuring linear displacements relative to reference points
- Deformation studies
- Calibrating length-measurement and angle-measurement instrumentation
- Non-contact surface profiling
- Measurements in vacuum chambers at pressures of  $>10^{-5}$  bar
- Measurements in UHV chambers
- Materials testing, e.g., dilatometry

## Technical Data for SP 120-D & SP 2000-D



	Model SP 120-D	Model SP 2000-D
<b>Length measurement range</b>	100 mm	2000 mm
<b>Length resolution</b>	~1.24 nm	~1.24nm
<b>Angular measurement range</b>	2 arcmin	2 arcmin
<b>Angular resolution:</b>		
- beam separation: 5.36mm	0.05 arcsec	0.05 arcsec
- beam separation: 12.6mm	0.02 arcsec	0.02 arcsec
- beam separation: 25.4mm	0.01 arcsec	0.01 arcsec
<b>Angular measurement range with focussed beam</b>	30 arcmin	30 arcmin
<b>Nominal laser wavelength</b>	632.8 nm	632.8 nm
<b>Laser frequency stability (after warm up period)</b>	$3 \times 10^{-7}$	$2 \times 10^{-8}$
<b>Laser warm up period</b>	1 min	10 – 20 min
<b>Operating temperature range</b>	15 – 30 °C	15 – 30 °C
<b>Maximum moving-reflector translation range</b>	600 mm/s	600 mm/s
<b>Dimensions (H x W x D):</b>		
- Sensor head	36x139x94mm	36x139x94mm
- Electronics module	150x450x400mm	150x450x400mm
<b>Weights:</b>		
- Sensor head	600 g	600 g
- Electronics module	9.5 kg	9.5 kg
<b>Interface:</b>		
- Serial	RS 232C	RS 232C
- Parallel (option)	IEEE 488	IEEE 488
<b>Plug-in PC board (option)</b>	ISA	ISA
<b>Fibre optic cable length</b>	3, optionally to 25 m	3, optionally to 25 m
<b>Supply-line voltage</b>	100 – 240 VAC	100 – 240 VAC
<b>Supply-line frequency</b>	47 – 60 Hz	47 – 60 Hz

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