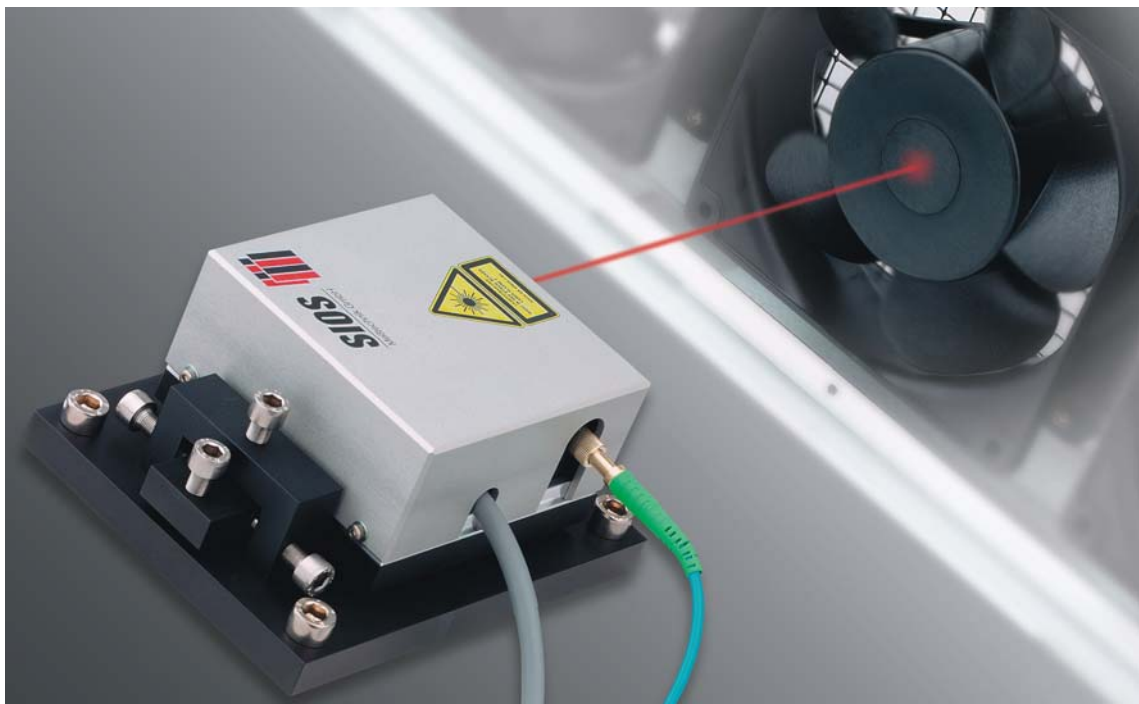

Laserinterferometric Vibrometer



SP-S Series

Design and Operation

Our laserinterferometric vibrometers are ideal instruments for accurate, noncontact determinations of temporal changes in the positions of objects or surfaces and detect mechanical vibrations at frequencies ranging from 0 to 500 kHz.

These instruments have been designed based on the proven concept of our SP-Series miniature plane-mirror interferometers. The sensor heads of Series SP-S interferometers are equipped with additional optics that allow for making measurements on surfaces having arbitrary roughness.

The complete system consists of a modularly designed electronics unit incorporating a laser, a compactly designed sensor head, and various interfaces.

The fiberoptic-coupled interferometer converts motions along the optical axes into interference fringes that are transmitted to fast, high-resolution, demodulation electronics for processing. Operation and display of results employs a PC running specialized data-analysis software.

Technical Data

Working distance: (Permanently factory set per customer specification.)	30...70 mm, 240 mm
Laser-spot diameter: (Varies with distance)	12...30 µm, 100 µm
Measurement range: (Varies with the characteristics of the surface involved.)	≤ ± 20 mm
Resolution:	0.3 nm
Sampling frequency range:	1...1000 kHz
Frequency range:	0...500 kHz
Wavelength:	632.8 nm
Surface roughness:	arbitrary
Surface reflectivity:	≥ 5 x 10 ⁻⁴
Translation rate:	1.5 m/s
Dimensions (H x W x D)	
• Sensor head:	36 x 72 x 72 mm
• Sensor head with alignment fixture:	54 x 115 x 90 mm
• Electronic signal-processing/ power-supply unit:	150 x 450 x 400 mm
Length of the cable inter- connecting the sensor head and electronics unit :	3 m; optionally available in lengths ranging up to 10 m

Software for Windows

- Spectrum analysis
- Digital filtering
- Record lengths ranging from 256 to 32,768 data points
- Computation of the speeds and accelerations of vibrational motions
- Spectral averaging
- Triggering by external hardware

Features

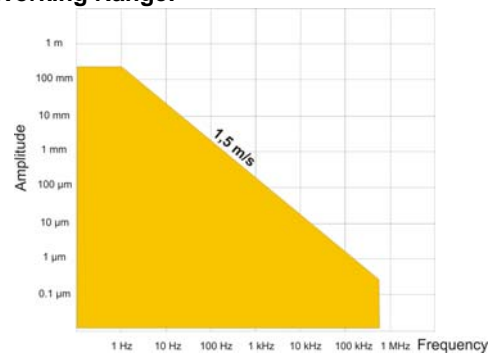
- A high precision vibration analysis and length measurement system
- Noncontact measurements
- Flexible installation
- Adaptable to suit customers' needs
- Fiberoptic coupling of the laser beam (eliminates thermal influences on measurement results)
- Corrects for ambient conditions
- Easy to align and use
- Lateral motions of objects being measured are not allowed if the objects involved have rough surfaces.
- Includes FFT spectrum-analysis software

Standard signal processor

Incremental signal-processing board equipped with vibrometer option:

- High speed signal processing board
- Cyclic data acquisition
- External triggering input
- Wavelength correction electronics
- RS-232 C serial interface
- USB interface

Working Range:



Optional signal processor

Analog data output:

- 8 length ranges
- 16-bit resolution for output amplitudes up to ± 3 V
- Cutoff frequency 150 kHz
- Continuous data output

Applications

- Making noncontacting vibration measurements on surfaces of arbitrary roughness
- Determining the vibrational modes of plates and shells
- Determining the resonant frequencies of microscopic objects
- Making multi-coordinate measurements employing several systems
- Performing high-precision length measurements

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