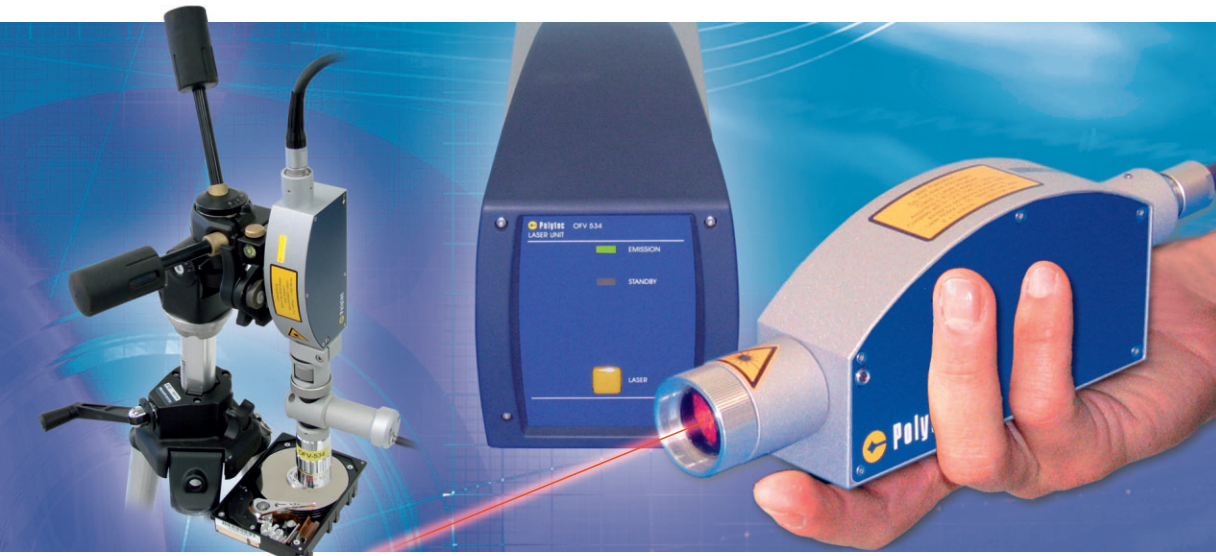


OFV-534 Compact Sensor Head



Modular Vibrometer System

- OFV-5000
Vibrometer Controller
– Velocity Decoders
– Displacement Decoders
- OFV-505/503
Standard Sensor Heads
- OFV-551/552
Fiber Interferometers
- OFV-534
Compact Sensor Head

Fitting a sophisticated heterodyne laser interferometer into an extraordinarily small package is only one of many design triumphs that sets the OFV-534 Compact Sensor Head apart from its competition. Two outstanding innovations include an integrated CCD video camera to improve test sample monitoring and laser spot positioning; and, a selection of add-on microscope lenses to measure microstructures with a micron-sized probe spot. These and other remarkable design features permit applications ranging from fast in-line quality control to precise R&D measurements.

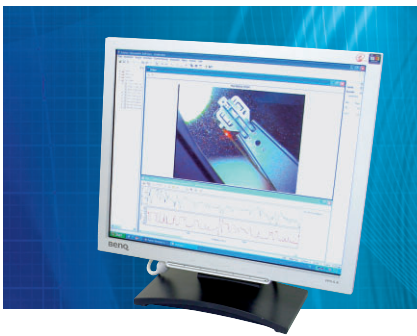
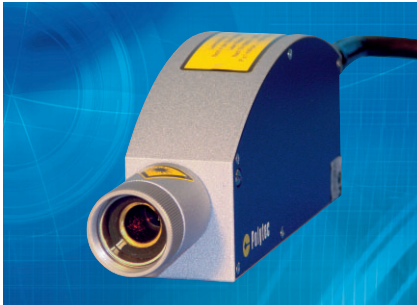
The Perfect Solution

Polytec Laser-Doppler Vibrometers represent the Gold Standard in optical vibration measurement. Designed for high optical sensitivity and independence from the sample's surface conditions, the OFV-534 Compact Sensor Head sends a clear input signal to a range of sophisticated Polytec vibrometer controllers for decoding. Low noise, high resolution and broad bandwidth (DC to 24 MHz) make the OFV-534 an excellent single-point probe for non-contact structural vibration analysis.

The Compact Vibrometer Head simplifies making precision vibration measurements where space and weight are at a premium. Its unique construction combines an external laser unit with a small, remote, fiber-coupled, light-weight head. This design permits the head to be easily inserted in constrained spaces or to be mounted on motion control stages.

Key Features and Benefits

- Very compact optical vibration sensor
- Ruggedized design for industrial environments (IP64)
- Practical, easy, "point & measure" capability
- Visible, class II laser with electronic shutter
- High optical sensitivity gives low noise measurements for a wide range of working distances and surfaces
- Optional CCD video camera for visually monitoring the structure under test
- Converts to a micro inspection tool with in-line illumination and a minimum laser spot size of 1.5 μm
- Interfaces with all OFV-5000 and OFV-2500 Series Vibrometer Controllers



OFV-534 Features

The sensor head housing is robust with IP64 protection, making it suitable for in-line quality control. Focusing distances from 200 mm to infinity combined with high sensitivity permit long stand-off distances and mounting flexibility. These characteristics are important for a general purpose tool for non-contact vibration measurements. By adding different objective lenses,

an internal color video camera and critical design accessories, the OFV-534 becomes a vibrometer that can be an OEM sensor in a test machine or a precision measurement instrument in a vibration lab. The wide range of OFV-534 accessories makes measuring large or small structures like ultrasonic transducers, MEMS, and hard disk drive suspensions easy.

How it Works

The OFV-534 has a unique design which includes a laser unit and a sensor head. The laser unit contains a Helium-Neon laser delivering its 633 nm laser light via an optical fiber to a high precision interferometer in the vibrometer head. The laser light splits into a measurement beam and a reference beam. The measurement beam is incident on the test object. The back scattered light is shifted slightly in frequency by the Doppler effect and contains the displacement and velocity information of test object.

A photo detector converts the optical signal created from the interference of the reference beam with the back scattered light into a frequency modulated electrical signal. This signal is then sent to a decoder circuit in the vibrometer controller where the FM signal is converted into a voltage signal proportional to either velocity or displacement.

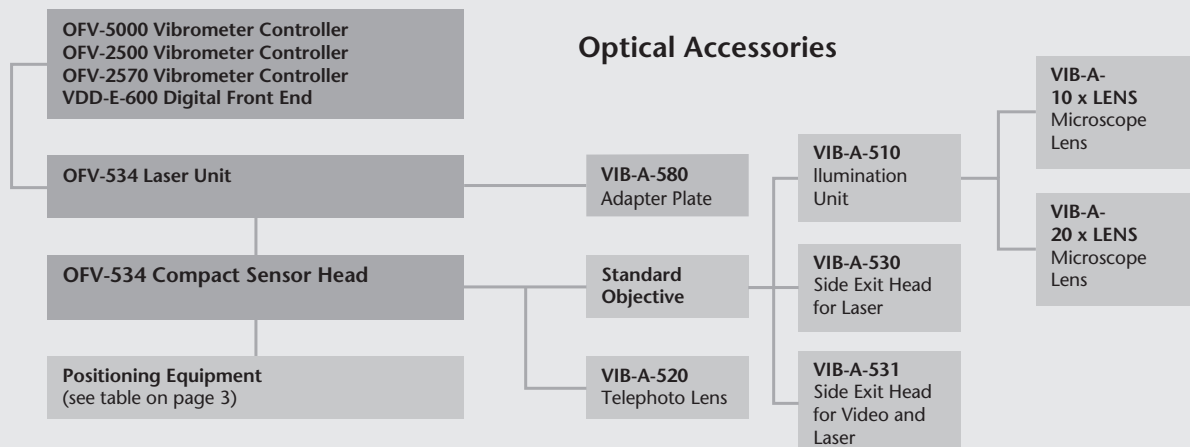
Expand the Capabilities

Placing the laser probe at the correct measurement location is essential for accurate results. The OFV-534 can be provided with an integrated video camera for a clear view of the structure under test, the measurement point and the laser beam. A standard PAL or NTSC video signal is provided which can be displayed via a video monitor (S-Video) or directly in the Polytec VibSoft data acquisition software.

Using Polytec's VibSoft data acquisition software, the engineer can display video images on an external video monitor, position the micron-sized laser probe, facilitate the measurement process on the test sample, and store a video snapshot with the measurement results. This feature provides traceable documentation of the measurement results and setup.

The measurement capabilities can be expanded with a range of microscope lenses and a super-bright in-line LED illumination unit. Together with the camera option, the OFV-534 becomes a single-point, microscope-based vibrometer for measurements on microstructures featuring a laser spot diameter down to 1.5 μm . A larger field-of-view can be achieved with a dedicated telephoto lens instead of a standard objective. It provides crisp video images with a 15 μm laser spot diameter and a field-of-view of 3.8 by 2.9 mm.

OFV-534 Based Vibrometer Systems



Benefits for Challenging Applications

QA and Production Testing

- Optional video camera
- IP64 industrial protection
- High optical sensitivity accommodates a variety of production environments
- Variable stand-off distance
- Compact and fully remote controlled
- Visible Class II laser for safe operation

Hard Disk Drive Testing

- VIB-A-520 Telephoto Lens for small laser spot diameter and large field-of-view
- VIB-A-T30 Basic Test Stand

Printers, Inkjet, Ultrasonic Actuators, Wirebonding, MEMS

- Very compact sensor head
- Microscope lens for 1.5 μm spot diameter
- VIB-A-510 super-bright LED illumination unit

General R&D

- High optical sensitivity
- Compact design
- Store image of test object with measurement file in VibSoft data acquisition system

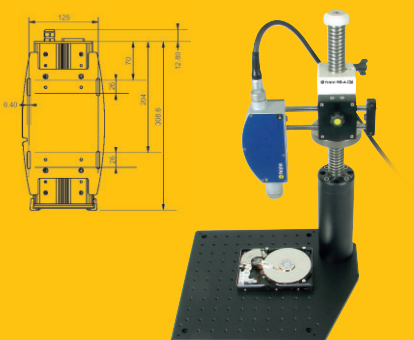


Options and Accessories

Optical Accessories	
VIB-A-534-CAM	Video camera option providing a NTSC output signal
VIB-A-534-CAP	Video camera option providing a PAL output signal
VIB-A-10xLENS	10X Microscope lens providing a laser spot diameter of 3 μm at 37.3 mm stand-off distance
VIB-A-20xLENS	20X Microscope lens providing a laser spot diameter of 1.5 μm at 21.7 mm stand-off distance
VIB-A-510 Illumination Unit	LED light source providing a coaxial illumination of the test object. The illumination unit is highly recommended in conjunction with the microscope lenses.
VIB-A-520 Telephoto Lens	Telephoto lens for applications requiring measurements of small objects over longer distances. Fixed working distance of 320 mm; field-of-view 3.8 by 2.9 mm, laser spot diameter 15 μm .
VIB-A-530 Side Exit Head (Laser)	Attached to the OFV-534 standard objective, this unit provides a 90 degree deflection of the laser beam. Probe tip diameter is 15 mm.
VIB-A-531 Side Exit Head (Laser and Video)	Attached to the OFV-534 standard objective this unit provides a 90 degree deflection of the laser beam and of the video image.
VIB-A-580	Adapter plate for mounting the laser unit

Positioning Equipment	
VIB-A-P01	Tilt stage
VIB-A-P02	2-axis stage: X plus tilt
VIB-A-P06	3-axis stage: XY plus tilt
VIB-A-P07	Pan/tilt adjustable mounting plate
VIB-A-T04	Tripod with standard pan-tilt head
VIB-A-T05	Tripod with geared pan-tilt head
VIB-A-T30	Test stand for vibration analysis of small and medium sized components like hard disk drives
VIB-A-T39	Flexible arm with magnetic base

For detailed information please refer to the "Vibrometer Accessories" section on our website www.polytec.com/vibrometers



OFV-534 Technical Data

Optical Specifications										
Laser type	Helium Neon (HeNe)									
Laser protection class	Class 2, <1 mW									
Laser wavelength	633 nm, visible red laser beam									
Minimum stand-off distance	200 mm (standard optical objective lens)									
Minimum spot diameter	1.5 µm (with VIB-A-20xLENS 20X Microscope Lens)									
Maxima of visibility	295 mm + n · 204 mm; n = 0; 1; 2; ...									
Video Camera (optional)										
Camera type	1/4" CCD Color Board Camera									
Active pixels (H x V)	510 x 492									
Lens aperture	F 4.5									
Shutter speeds	Automatic from 1/60 to 1/100,000									
Video output	Composite (CVBS), 1 Vp-p @ 75 Ohm, BNC									
Characteristics		2)	3)	4)						
Stand-off distance ¹⁾	mm	21.7	37.3	200	300	320	500	1,000	2,000	each m
Laser depth-of-field	mm	0.012	0.048	±1	±3	±0.08	±10	±40	±170	–
Spot diameter (1/e ²)	µm	1.5	3.0	25	40	15	70	148	302	add 150
Camera field of view	mm x mm	0.68 x 0.52	1.36 x 1.04	10 x 8	17 x 13	3.8 x 2.9	31 x 24	64 x 49	130 x 100	–

¹⁾ Measured from the front edge of the sensor head housing; as for the 10X-, 20X-microscope lens and the telephoto lens measured from the front edge of the lens

²⁾ With VIB-A-20xLENS 20X Microscope Lens

³⁾ With VIB-A-10xLENS 10X Microscope Lens

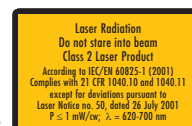
⁴⁾ With VIB-A-520 Telephoto Lens

General Specifications		
Component	Compact Sensor Head	Laser Unit
Dimensions (L x W x H)	201 mm x 39 mm x 71 mm (7.9 in x 1.5 in x 2.8 in)	322 mm x 121 mm x 154 mm (12.6 in x 4.7 in x 6.1 in)
Weight	1 kg (2.2 lbs)	4.2 kg (9.3 lbs)
Housing protection	IP64	IP40
Power	max. 3 W	max. 15 W
Cable length	3 m (to Laser Unit)	
Ambient temperature	+5 °C ... +40 °C (41 °F ... 104 °F)	
Storage temperature	–10 °C ... +65 °C (14 °F ... 149 °F)	
Relative humidity	max. 80%, non-condensing	
Compatibility ¹⁾	OFV-5000, OFV-2500 Series, OFV-2570 Vibrometer Controllers, VDD-E-600 Digital Front-End	

¹⁾ When operating the OFV-534 Sensor Head with OFV-2510, OFV-2502 or OFV-5000 Controllers manufactured before May 2006, the signal level display on the sensor is not available.

Compliance with Standards	
Laser safety	IEC/EN 60825-1 (CFR 1040.10, CFR 1040.11)
Electrical safety	IEC/EN 61010-1
EMC	IEC/EN 61326

For more information, please visit our website
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