



VSM 100

# SINGLE-HEAD LASER VIBROMETER

- **NON-CONTACT MEASUREMENT OF LARGE (UP TO 10 mm) AND SMALL (DOWN TO 1 nm) VIBRATIONS**
- **FREQUENCY RANGE: FROM DC TO 50 KHZ**
- **NOVEL INTERFEROMETRIC CONFIGURATION**
- **DISPLACEMENT ANALOG OUTPUT**
- **SMALL SIZED OPTICAL HEAD**
- **EASY BEAM ALIGNMENT WITH AUTOMATIC SPECKLE-TRACKING**
- **WORKS ON ALL DIFFUSIVE SURFACES (METAL, RUBBER, PAPER, FABRIC, ETC.)**

## NEW LASER VIBROMETERS FROM JULIGHT

Julight VSM 100 Laser Vibrometer allows easy and accurate non-contact vibration measurements on all rough and diffusive surfaces (e.g.: unfinished metal, plastic, rubber, paper, fabric, etc.). It provides an analog electrical output which is a replica of the target displacement (with 1 mV/μm responsivity), in a frequency range from DC to 50 kHz, with a minimum measurable displacement as small as 0.4 nm (for 1 Hz noise bandwidth), a peak-to-peak maximum vibration amplitude larger than 20 mm, and a maximum velocity of 0.5 m/s. VSM 100 is highly versatile and it is reasonably priced, allowing customers to access the precise world of laser non-contact measurements.

## PRINCIPLE OF OPERATION

Julight Laser Vibrometers are based on the novel self-mixing interferometric scheme, and make use of a compact semiconductor diode laser. While conventional Laser Doppler Vibrometers/Velocimeters (LDVs) use the complex Michelson interferometric configuration, the self-mixing scheme is based on the coherent interference of the backscattered light directly into the laser diode, allowing for a reduced optics count. Julight Laser Vibrometers have a high sensitivity, which allows correct operation even for weak intensities of the light backscattered by the diffusive target surface.

## FEATURES

- Easy-to-use equipment
- Extremely compact size of the optical head
- Displacement analog output
- Sub-micrometer resolution

## APPLICATIONS

- Non-contact measurement of vibrations
- Automotive, Aerospace, and Mechanical Industry
- Vibration measurement without mass-loading on small, soft and delicate structures
- Loudspeaker and piezoceramic testing
- Material analysis
- Modal analysis
- On-line process & quality control in industrial plants

## USE

The laser beam shall be aimed at the target surface, and the vibration signal is readily available from the output BNC connector. Automatic Speckle-Tracking functionality allows unattended operation on any diffusive surface, while an LED-bar indicator measures optical signal strength in real-time. The vibration signal can be displayed onto an oscilloscope, or supplied to a FFT analyzer for frequency domain analysis.



Left: VSM 100 Laser Vibrometer main unit  
Right: Standard optical head, with Speckle-Tracking functionality

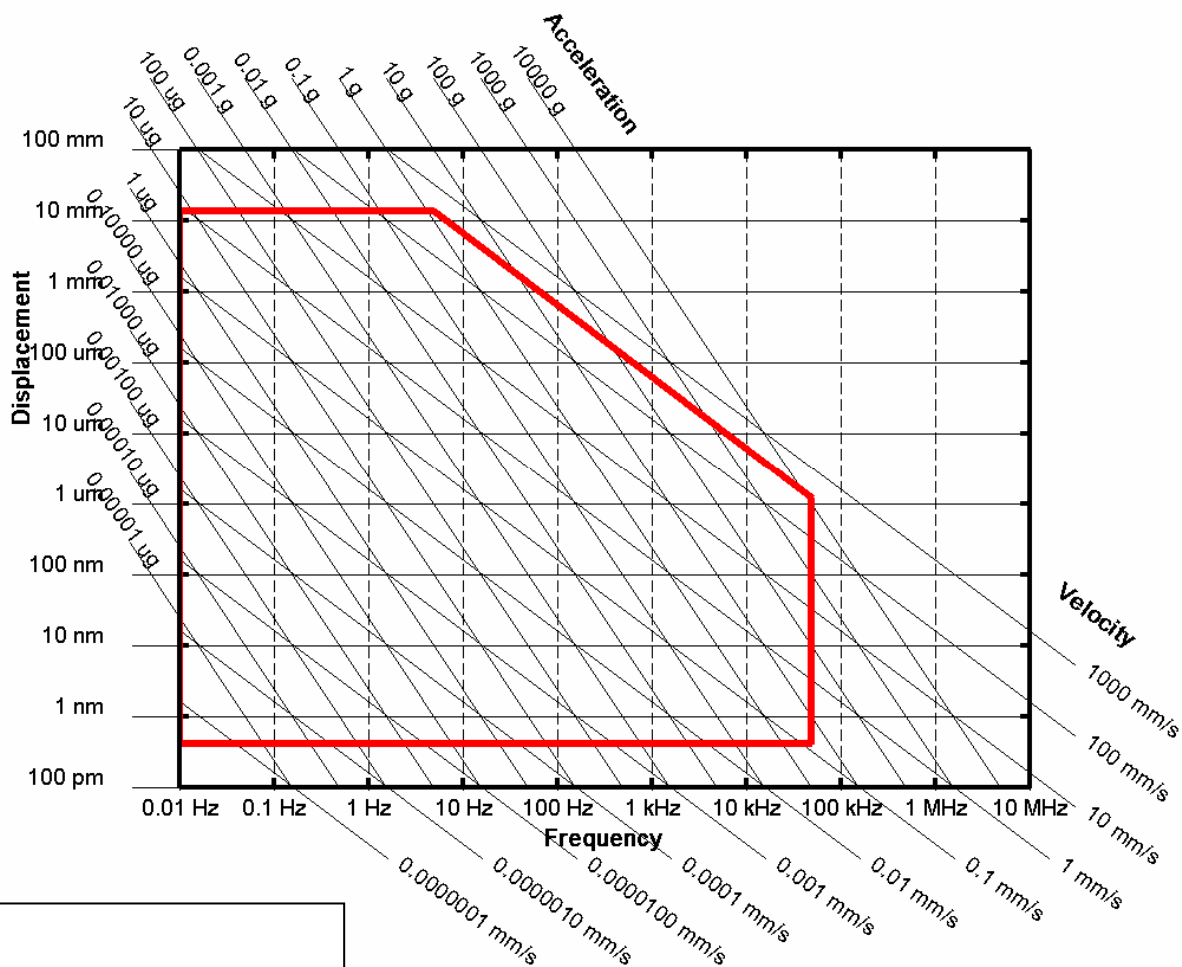


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Performance	
Maximum measurable vibration (peak-to-peak)	25.5 mm
Maximum measurable velocity	> 0.5 m/s
Output signals	<ul style="list-style-type: none"> <li>• Vibration displacement (analog, BNC connector)</li> <li>• Monitor (3.5mm jack)               <ul style="list-style-type: none"> <li>- Optical signal strength (analog)</li> <li>- Speckle-Tracking active / inactive (digital)</li> </ul> </li> </ul>
Output signal responsivity (displacement)	1 mV/μm
Resolution	Noise-limited
Noise Equivalent Displacement	400 pm/√Hz
Output signal accuracy	1 %
Spatial transversal resolution	250 μm
Target surface	Diffusive or back-reflecting

Physical	
Laser power	17 mW
Laser wavelength	770 ± 10 nm
Laser safety class	3B
Working distance (± depth of focus) (factory pre-set, user selectable)	20, 40, 100 cm (± 1.5 cm)
Optical head dimensions	25 mm x 60 mm x 100 mm (Standard optical head with Speckle-Tracking functionality)
	25mm x 30mm x 150mm (Optional, without Speckle-Tracking)
Optical head cable length	2 m
Electronic unit dimensions (W x D x H)	11.6 cm x 24.6 cm x 15.5 cm
Power supply	110-120 V ac / 60 Hz 220-240 V ac / 50 Hz
Weight	3 kg
Temperature	0 °C to +50 °C (+32 °F to +122 °F)

## VSM 100 LASER VIBROMETER PERFORMANCE



Distributor information



INVISIBLE LASER RADIATION  
AVOID EXPOSURE TO BEAM  
CLASS 3B LASER PRODUCT  
λ = 785 nm ; P max. < 20 mW  
(EN 60825-1:2007-10)