

PSV-500-3D Scanning Vibrometer

Polytec 3D Scanning Vibrometers are the state-of-the-art tools to quickly and accurately determine operating deflection shapes and Eigenmodes for structural vibration validation with reliable experimental data.

The H and M versions of the 3D system cover a frequency range up to 100 kHz or 2 MHz.

The turn-key modular rack system contains a front-end, data management system and 3 scanning heads with tripod plus a wide range of optional accessories and PSV software package.



Highlights

- Non-contact laser measurement
- Full-field with high spatial resolution
- Open-minded PSV software with open data and control interfaces
- Expandable to fully automated RoboVib® Test Station
- Wide range of accessories and software options

PSV-500-3D Scanning Vibrometer

Full-field 3D Vibration Measurement at Low and Mid Frequencies

Datasheet



Technical Data



PSV-500-3D Standard Components

Vibrometer system	PSV-I-500 Scanning Head with high precision scanner, HD video 20x zoom camera and PSV-G-500 Geometry Scan Unit; 2x PSV-I-520 Scanning Heads; CoherenceOptimizer (Laser frequency stabilization) for all 3 scanning heads; PSV-F-500 Front-End with 3 digital broadband decoders, signal generator and data acquisition for reference channels (PSV-500-3D-H); PSV-E-500 Junction Box; 3x PSV-C-510 main cable, 10 m
Computer	PSV-W-500 Data Management System: 19" industrial PC with data acquisition and signal generator board installed (PSV-500-3D-M); Windows® 7 64-bit for “embedded systems” and PSV Software preinstalled
Accessories	PSV-A-014 System Cabinet: Workstation and storage for all standard accessories, integrated 24" TFT Monitor with swivel stand; VIB-A-T02-S set of 3 tripods with fluid head; hardware manual, software manual, and theory manual; laser adjustment goggles and reference object for head alignment

PSV-I-500 / PSV-I-520 Scanning Head

Dimensions [W x L x H]	189 x 370 x 177 mm (74.4 x 145.7 x 69.7 in)
Weight	PSV-I-500: 9.2 kg (20.5 lbs); PSV-I-520: 9.0 kg (19.8 lbs)
Laser type, vibrometer	HeNe Laser (633 nm)
Laser type, PSV-G-500 Geometry Scan Unit	Diode laser (660 – 680 nm)
Laser class	Class 2 (<1 mW visible output)
Working distance	125 mm ... ~100 m (PSV-G-500 Geometry Scan Unit!: 250 mm ... 30 m)
Scan angle [h x v]	50° x 40°
Scanner properties	Angular resolution <0.002°, Angular stability <0.01°/h, max. 30 scan points/s
Sample size	From a few mm ² up to several m ²
Camera	HD format, 20x optical zoom, max. field of view [h x v] 55° x 32°
Interfaces, electrical	Multi-pin bayonet connector, DIN plug for pan/tilt head control or external scanner control
Interfaces, mechanical	Hexagon type tripod adapter for VIB-A-T02, 2x M6 thread

PSV-F-500 Front-End

Dimensions [W x D x H]	485 x 380 x 150 mm (19", 84HP/3U)
Weight	~10 kg (~22 lbs)
Protection class	IP-20
Interfaces, electrical	Front: BNC connectors for reference channels, signal generator, trigger; Rear: multi-pin bayonet connector, mains cable, RJ45 Ethernet to computer
Interfaces, mechanical	19" Rack mount adapters

PSV-E-500 Junction Box

Dimensions [W x D x H]	485 x 60 x 150 mm (19", 84HP/3U)
Weight	~8 kg (~17.6 lbs)
Protection class	IP-20
Interfaces, electrical	4 multi-pin bayonet connector for 3 umbilical cables and interconnection to PSV-F-500 Front-End, main cable, 1x RJ45 Ethernet to computer
Interfaces, mechanical	19" Rack mount adapters

General Specifications	
Overall weight	186 kg
Powers	100 VAC ... 240 VAC \pm 10%, 50/60 Hz; overall max. 650 VA
Environmental conditions	Operating 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
Calibration	Recommended every 24 months (shorter re-calibration intervals available upon request)

Metrological Specifications							
Model	Decoder	# of ranges	Full scale m/s (peak)	Decoder frequency range	Resolution ¹ (μ m/s) / \sqrt Hz	# of reference channels	# of signal generator channels ²
PSV-500-3D-H	DV-03	13	0.001...10	0 Hz ... 100 kHz	0.01 ... 0.5	8	4
PSV-500-3D-M	DV-04	13	0.001...10	0 Hz ... 1(2)MHz	0.01 ... 2.5	1	1

Compliance with Standards	
Electrical safety	IEC/EN 61010-1:2011-07 IEC/EN 61326-1:2006-10 Emission: FCC Class B, IEC/EN 61000-3-2 and 61000-3-3 Immunity: IEC/EN 61000-4-2 to 61000-4-6 and IEC/EN 61000-4-11
Laser safety	IEC/EN 60825-1 (2008) (CFR 1040.10, CFR 1040.11)

General Accessories	
PSV-A-525 Front Window	Protects the scanning mechanism against dust, wind and acoustic excitation at high dB levels
PSV-C-5xx Main Cable	Available length: 5, 10, 20 and 30 m
For Measurements on Small Parts	
PSV-A-T34 Table Tripod	Rigid support of 3 PSV scanning heads. Provides a configuration optimized for in-plane performance with small parts.
PSV-A-T35 Table Tripod	Rigid support of 3 PSV scanning heads. Provides a narrow configuration optimized for out-of-plane performance with small parts.
PSV-A-T51 Motorized Tripod	Convenient motorized support for 3 PSV scanning heads
Accessories for (Brake) Acoustics and Modal Analysis	
PSV-A-430 Acoustic Gate Unit	Activates the gate input if a noise exceeds a certain threshold
PSV-A-MIR / PSV-A-MIR+ Mirror Set	Mirror set for measurements in difficult-to-access areas. The mirror set comprises 4 (PSV-A-MIR+; 5) HeNe coated mirrors including magnetic fixtures.
A-MIR-2030 Mirror Set	Mirror set with one mirror 200 x 300 mm including magnetic fixtures



PSV-C-5xx Main Cable



PSV-A-T34 Table Tripod



PSV-A-013/14 System Cabinet

¹ The noise-limited resolution is defined as the signal amplitude (rms) at which the signal-to-noise ratio is 0 dB with 1 Hz spectral resolution, measured on 3M Scotchlite Tape™ (reflective film). The attainable resolution is frequency-dependent and is specified for frequencies above 1 kHz.

² Bandwidth corresponding to acquisition bandwidth.

Software Options

Model	PSV-500 Scanning Vibrometer	-H	-M
Preparation			
APS Professional	For arbitrary definition of measurement points and individual object properties	S	S
Geometry Data Import	Geometry module for importing geometry data to the PSV software for defining the scan points	O	O
VideoTriangulation®	Image processing for enhanced automatic alignment of the laser spot with the grid points	O	O
Signal Generator	Internal arbitrary signal generator for vibration excitation	S	S
Measurement			
High Resolution Scan	Up to 512 x 512 scan point density for higher spatial resolution	S	S
FastScan	Fast scan routine for analyzing the response of structures at a single frequency	S	S
Time Domain Animation	Time domain data are acquired while scanning. Allows for "slow motion" animation e.g. of surface waves propagation or switches.	O	O
Extended FFT Lines	Various options to extend the number of FFT lines up to 819,200	O	O
Multi Frame	For triggered measurements on combustion engines and brakes	O	-
Bandwidth Extension	Extends the acquisition bandwidth to 2 MHz	-	O
Gate Input	Allows gated measurements with external TTL signal	S	S
Analysis & Interfaces			
SignalProcessor	The user interface to the math library included in the PSV software, designed as an easy-to-use spreadsheet	S	S
UFF Interface	Universal File Format data conversion from and to major modal analysis and Finite Element packages	S	S
PCA	Principal Component Analysis. For MIMO measurements in experimental modal analysis.	O	-
ME'scope Modal Software	Software package for modal analysis. Including data interface.	O	O
Data Export to ME'scope	Data export to Vibrant's ME'scope modal analysis software	O	O
ASAM ODS	Import and export of data in ASAM ODS 5.2.0 ATFX standard	O	O
Audio Analysis	Makes vibration data audible. Allows listening to live and stored vibration signals.	O	O
Desktop Analysis Version	Desktop version of PSV Software for offline post processing and presentation of measurement results	O	O
Automation and programming interface			
Macro Programming	WinWrap® Basic Engine: Visual Basic® for Applications (VBA) compatible. Allows automation of test routines.	S	S
Polytec File Access	API for retrieval of Polytec data via external applications supporting Microsoft's Component Object Model (COM), e.g. Visual Basic .NET®, C#, MATLAB®, LabVIEW™	S	S
Maintenance package			
Software Maintenance Basic	Basic software maintenance. Free PSV Software updates for a period of 1 year.	S	S
Extended Software Maintenance	Entitles for software updates for an additional period. Available in 12 month increments.	O	O
University Program	Lifetime update license for universities and education (terms and conditions apply)	O	O

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S: Standard
O: Option
-: Not available



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