



# Industrial Hygiene Vibration Monitor

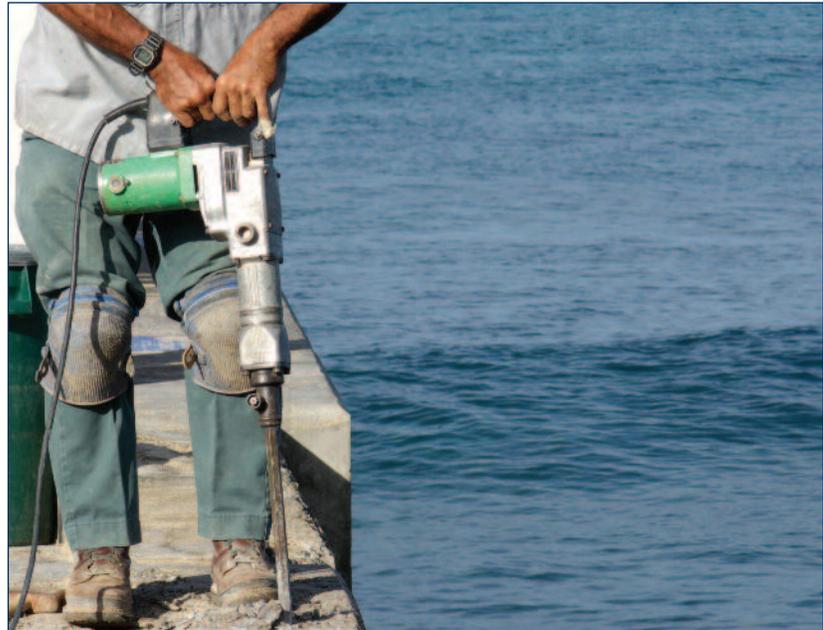
Complete Convenient System for Exposure Limit Compliance Testing

## Highlights

- Frequency weightings and measurements for hand-arm and whole-body vibration
- Conforms to ISO 2631 and 5349; Type 1 instrument per ISO 8041
- Displays "Exposure Points" (Hand-Arm Mode)
- Simultaneous 3-channel measurements: X, Y and Z axes, plus Sum (S)
- Lightweight and portable
- Records up to 200 hours of time history
- Programmable AC or DC signal output
- Interface-to PC (USB/Serial).

## Applications

- Worker exposure assessment
- Compliance with EU Physical Agents Directive 2002/44/EC
- Ergonomic evaluation
- Workstation design and optimization
- Quantify risk of injury per accepted permissible exposure limits
- Qualify hand-tool performance
- Determine effectiveness of anti-vibration gloves and materials



HVM100 is ideal for hand-arm and whole-body exposure assessments

Exposure to high levels of vibration has been shown to cause permanent injury if left unchecked and untreated. Determining potential for injury from exposure to vibration should be considered part of a comprehensive ergonomic evaluation and risk assessment program.

Model HVM100 from Larson Davis provides a portable, practical means for quantifying exposure data on the job, whether the work is performed inside manufacturing or process plants or at the most remote agricultural, mining or construction sites.

Wherever there is work to be done using heavy mobile equipment or rotating reciprocating hand tools powered by air, electricity, or internal combustion, the HVM100 is the easy way to obtain and document the levels of exposure that have been proven to cause a wide range of potential injury including Hand-arm Vibration Syndrome (HAVS – also known as 'Vibration White Finger Disease' or VWF) and other more insidious physical effects.



HVM100



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## HVM100 Simplifies Vibration Exposure Monitoring

HVM100 is a hand-held instrument for measuring human exposure to vibration, performing relevant calculations and providing overall metrics on its LCD display. Detailed vibration levels are easily stored in its built-in data logger, which can hold up to 100 separate time-history test files including all required metrics. This information can then be downloaded to a PC for analysis and archiving.

Measuring all three axes of vibration simultaneously greatly simplifies the setup of a test and enhances the repeatability and correlation of the vibration data. From the three channels of measured data, the HVM100 automatically calculates vector sum information and presents it as a fourth set of data values. For compliance with the latest measurement standards, the HVM100 employs digital filters for each channel that can be enabled as needed, and will never be obsolete – should standards change, the filters can be upgraded electronically!



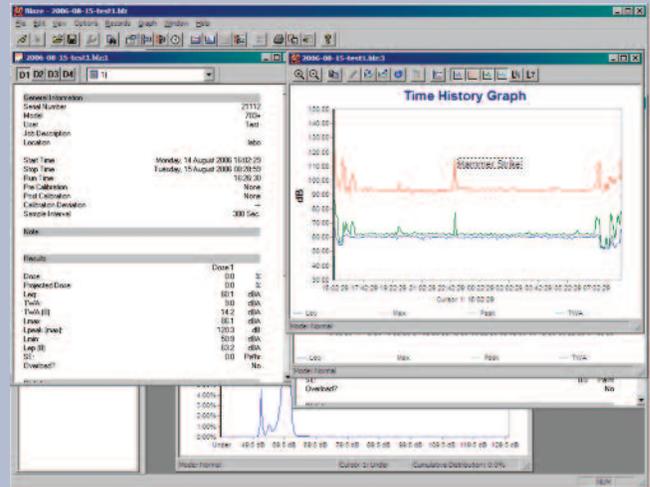
Configured as a complete system, including everything from sensors to software, HVM100 comes with everything you need to confidently generate meaningful exposure documentation. From mechanical hand-arm adapters that locate the sensors properly in relation to the operator's grip of the tool – or a 'seat-pad' accelerometer for measuring whole-body vibration, you'll have all the right bits and pieces to make measurements accurately and consistently. What's more, with Blaze® software, you'll have a simple means of setting up a test, controlling the instrument and analyzing the resulting data.

To increase user-friendliness, the HVM100 comes standard with four out of eight possible language options – including Italiano, Español, and Deutsch (Italian, Spanish, German)! Any way you say it, the HVM100 is the best solution for Safety and Health professionals when it comes to vibration exposure monitoring.

### Glove Transmissibility Measurement:

Only Larson Davis offers a unique 'Palm Adapter' that locates a sub-miniature triaxial accelerometer (sensor) in a specially designed 'cup'. This cup fits unobtrusively in the worker's palm, and can measure the vibration levels with and without a vibration damping glove in place – thus providing you real data on attenuation levels!

### Supported by BLAZE® Application Software



Blaze® is the Industrial Hygiene and Safety Professional's analysis package of choice – combining ease-of-use with powerful reporting capability, Blaze® makes gathering and managing your vibration exposure data an absolute breeze! Combining summary data and a concise color graph of the vibration levels over time on just one page, you can easily present reports that are clear and understandable by workers and management alike. The ability to present detailed time-history reports and labeled graphs in addition to the summary reports gives even more presentation options.



Also available  
**HVManager™**  
See separate  
data sheet.

Blaze® makes instrument calibration, setup and deployment a snap – no need to press any keys – if you prefer, simply create and store multiple setup files in a Blaze® 'library' to cover all your possible measurement applications. Blaze® even stores individual calibration data on all your accelerometers, and makes changing from hand-arm to whole-body measurement setups in the field effortless and foolproof!

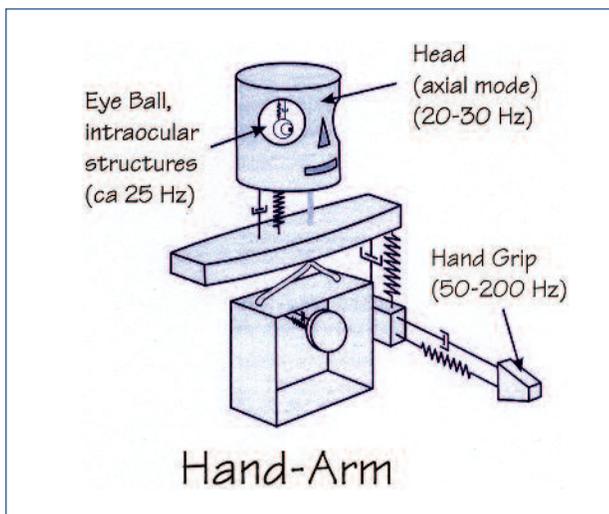
And for those who do noise exposure monitoring, you'll be glad to know Blaze® supports the Larson Davis Spark® series personal noise dosimeters and the SoundTrack LxT® octave band sound level meters, too! Contact your Larson Davis representative for information.

## About Human Exposure to Vibration in the Workplace

Risks to workers from exposure to high levels of vibration include decreased performance and even permanent injury. Two common types of vibration exposure have been identified as deleterious: hand-arm vibration and whole-body vibration.

These exposures are prevalent in the following industries:

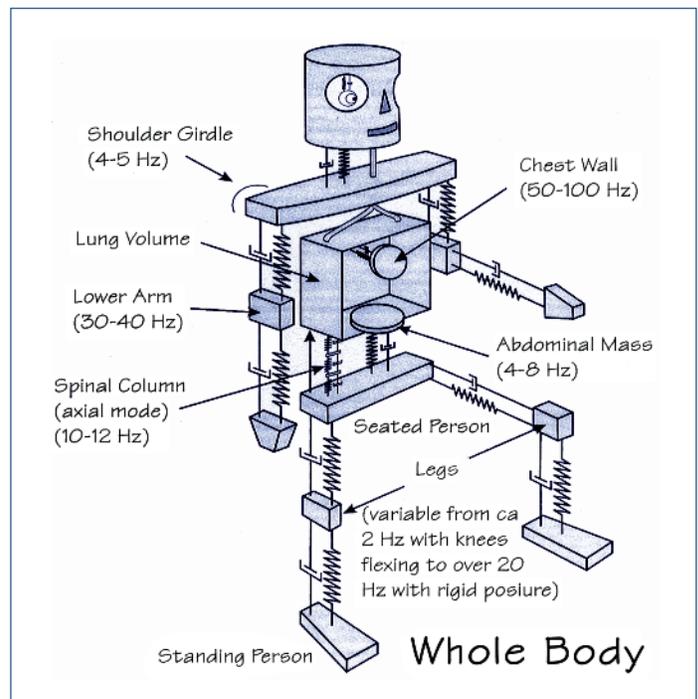
- Foundries / Metalworking
- Shipbuilding
- Transportation / Material Handling
- Construction
- Logging
- Mining



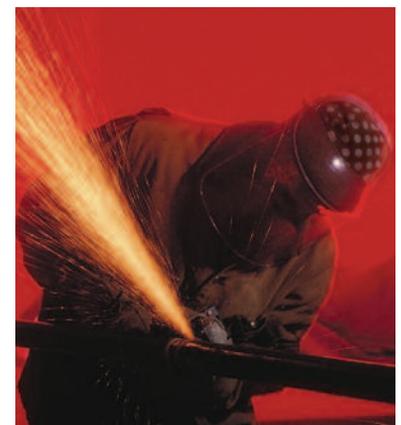
Worker exposure to high levels of vibration from powered hand tools can cause vibration syndrome symptoms such as numbness, pain, tingling and blanching. Vibration syndrome exposures induce adverse circulatory and neural effects in the fingers and hands that can become irreversible if left unchecked over as little as one year's time. Reduced tactile feeling and dexterity resulting from these exposures decreases workers' ability to perform critical tasks with precision. Often called vibration white finger disease (VWF), this condition is progressive and debilitating. Pneumatic- and electric-powered hand tools are often the cause of these unacceptable exposure levels, and even hand tools that were initially selected to emit lower levels of vibration may degrade through typical use and improper maintenance, leading to increasing and ultimately unacceptable levels of exposure over the working life of the tool.

High levels of whole-body vibration exposure are common to workers who operate heavy machinery, material handling and transport equipment, or whose operator stations are in proximity to heavy rotating, stamping or reciprocating machinery. Physical effects to the worker can include damage to the spinal column, and can manifest as low back pain or back, neck and shoulder disorders. Some studies point to possible negative reproductive effects in female populations exposed to high levels of whole-body vibration.

Until now, it has been difficult to quantify these exposures accurately and consistently. Vibration must be measured in three directions, or axes, simultaneously and this acceleration information must be integrated into useful values and scientific units of measure. Further, measuring the frequency range of the vibration is critical to assessing the potential for physical damage. For example, the frequencies of interest in determining potential injury from hand tools are as high as 1000 Hz, whereas whole-body vibration exposures are most damaging at lower frequencies – in the case of the spinal column, primarily from about 0.5 to 80 Hz.

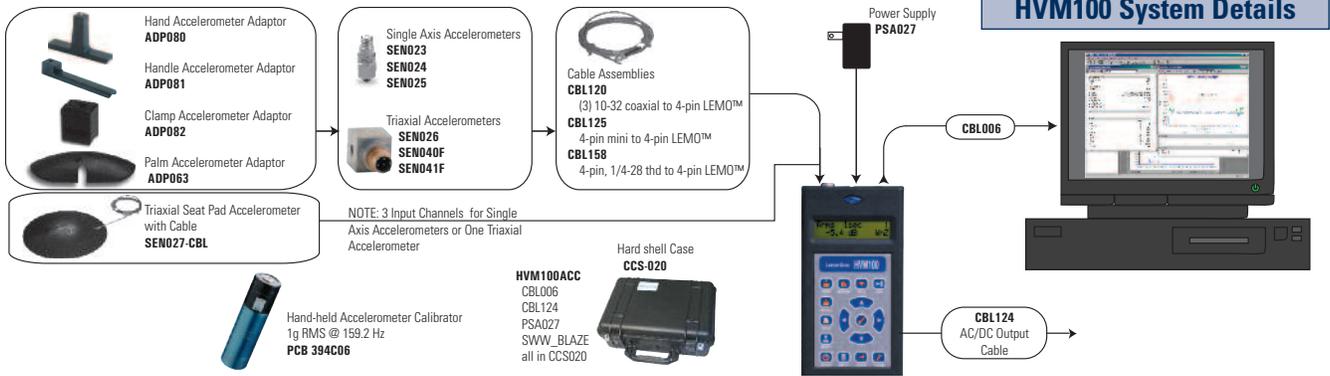


Recent ISO and ANSI standards have been promulgated that define measurement criteria and exposure limits that are useful and practicable for Safety and Industrial Hygiene professionals to implement. This methodology uses a broadband measurement of only the frequencies of interest for determining the severity of the two main types of exposures. The HVM100 provides relevant exposure metrics including Aeq, A(8), AET, Exposure Points, Crest Factor and Vibration Dose Value. This approach simplifies the number of readings that must be taken, and as implemented in HVM100, vastly increases the speed at which an accurate assessment can be made.





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## HVM100

### Technical Specifications

Input types	ICP® sensors, direct voltage
Input range	>100 dB (in multiple ranges)
Range gain	x1, x10, x100, x1000
Calibration	By level or sensor sensitivity entry
Units	m/s <sup>2</sup> , cm/s <sup>2</sup> , ft/s <sup>2</sup> , in/s <sup>2</sup> , g, dB
Metrics for each mode:	
Vibration:	Arms, Amin, Amax, Aeq, Amp, Peak
Hand-arm:	Arms, Amin, Amax, Aeq, Amp, Peak, A(1), A(2), A(4), A(8), A(8) AET, EP
Whole-body:	Arms, Amin, Amax, Aeq, Aeq(k), Amp, Peak, CFmp, CF, VDV
Frequency weighting	
Vibration	Ws (Severity), Fa (0.4 Hz to 100 Hz), Fb (0.4 Hz to 1250 Hz), Fc (6.3 Hz to 1250 Hz)
Hand-arm	Wh
Whole-body	Wb, Wc, Wd, We, Wg, Wj, Wk, Wm
Setups	Store up to 10 user setups
Memory	100 measurements, 1 min to 99 hr
Time history	120 samples of Arms & PEAK at a period of 1, 2, 5, 10, 20, 30, 60 sec
Interface	USB (with DVX008A USB to DB9M Serial Adaptor) RS-422/RS-232 serial interface; modem mode
Printout	Custom 3 line header, data and time history
Outputs for each channel	
AC	Weighted or band-limited
DC	rms, min, max, peak, sum RMS, sum max, sum min, sum peak
Peak	± 0.5 dB accuracy
Power	(2) AA batteries (IEC Type LR6) <i>Batteries included</i>
Weight	300 gm (10.6 oz)
Dimensions	1.1 x 3.3 x 6.0 in (28 x 84 x 152 mm)
Standards met	ISO 8041:2005, 2631-1:1997, 2631-2:1989, 2631-4:2001, 5349-1:2001, and 5349-2:2001, ANSI 2.70-2006 plus it provides the whole-body frequency weighting Wg specified in the British Standard BS 6841:1987. CE compliant.

### Available Configurations

AVAILABLE LANGUAGES	
STANDARD:	English, Spanish, German, and Italian.
HVM100-OPT2:	English, German, Portuguese and Czech.
HVM100-OPT3:	English, German, Italian and French
HVM100-OPT4:	English, German, Dutch and French.

### Optional Accessories

ADP080	Hand accelerometer adaptor "T" bar
ADP081	Handle accelerometer adaptor, straight bar
ADP082	Clamp accelerometer adaptor, mounting block with clamp
ADP063	Palm accelerometer adaptor
ADP064	HVM100 adaptor kit includes hand, handle, clamp & palm adaptors
CBL006	Serial interface cable for HVM100. Used to connect to a PC
CCS020:	HVM100 Hard shell carrying case
HVM100-ACC	Accessories include one each: CBL006 RS-232 Computer interface cable, CBL124 AC/DC Output cable, CCS020 HVM100 Hard shell carrying case, PSA027 HVM100 Power supply, SWWBLAZE® Analysis software for HVM100.
394C06	The 394C06 provides a controlled vibration level for verifying sensitivity of accelerometers of up to 85 grams in weight.
PSA027	90 to 264V to 12V switching power supply for HVM100
SEN040F-CBL	Triaxial accelerometer, 1 mV/g ICP® & CBL158
SEN041F-CBL	Triaxial accelerometer, 10 mV/g ICP® & CBL158. The SEN041F has an internal filter, which helps attenuate high frequency vibrations before they can overload the internal preamplifier in the accelerometer
SEN023-CBL	Single axis accelerometer, 1 mV/g ICP® & CBL120
SEN024-CBL	Single axis accelerometer, 10 mV/g ICP® & CBL120
SEN025-CBL	Single axis accelerometer, 100 mV/g ICP® & CBL120a
SEN026-CBL	Triaxial palm accelerometer, 10 mV/g ICP® & CBL125
SEN027-CBL	Seat pad accelerometer, triaxial & CBL122
SWW_BLAZE:	Dosimetry software for HVM100 and Spark® family instruments

### Available Configurations (partial listing, consult factory)

HVM100-ALL-40:	Hand-arm & whole-body vibration kit includes HVM100, HVM100-ALL, 1 mV/g accelerometer (SEN040F), seatpad accelerometer (SEN027), handle adaptor (ADP081), cables (CBL006, DVX008A, CBL158), case (CCS028), and Blaze® software.
HVM100-ALL-41:	Hand-arm & whole-body vibration kit includes HVM100, HVM100-ALL, 10 mV/g accelerometer with filter (SEN041F), seatpad accelerometer (SEN027), handle adaptor (ADP081), cables (CBL006, DVX008A, CBL158), case (CCS028), Blaze® software.
HVM100-ALL-26	Hand-arm & whole body vibration kit includes HVM100, HVM100-ALL, accelerometer (SEN026), seatpad (SEN027), palm adaptor (ADP063), cables (CBL006, DVX008A, CBL125), case (CCS028), Blaze® software.

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For environmental noise monitoring and building acoustics, **Larson Davis** offers a full line of instruments, accessories and software. For personal noise and vibration exposure monitoring, Larson Davis complements this with sound level meters, personal noise dosimeters, human vibration meters, audiometric calibration systems and hearing conservation programs.

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