



Tactile vibrometer

Introduction

The *HVLab* Tactile vibrometer has been developed through pioneering research at the University of Southampton's Institute of Sound and Vibration Research, a world-class leader in its field. The *HVLab* Tactile Vibrometer provides computer-controlled measurement of tactile thresholds for vibration stimuli. Threshold measurements may be used to indicate sensorineural dysfunction. The *HVLab* Tactile Vibrometer is used in medical, industrial, research and educational establishments world-wide.

Applications

The *HVLab* Tactile Vibrometer may be used for the assessment of sensory changes associated with neurological dysfunction. The equipment is used in research, occupation health, clinical and medical practice.

Applications include:

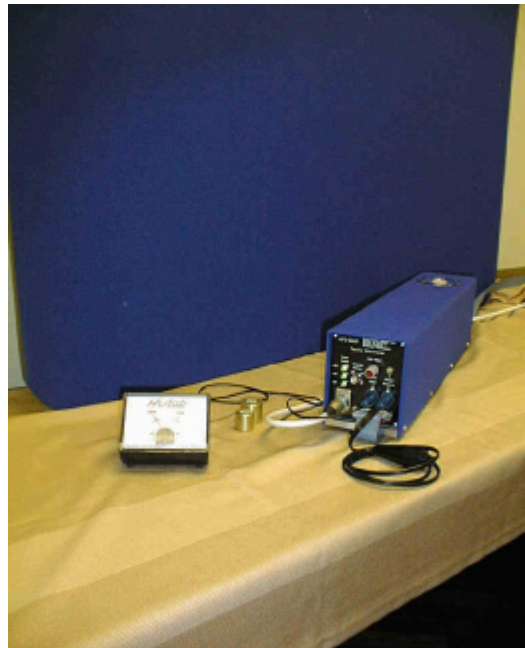
- Fundamental research
- Pre-employment screening
- Monitoring programmes
- Diagnosis

Features

The *HVLab* Tactile Vibrometer system consists of a vibrometer unit, patient response button, force meter, computer interface card and software.

An electrodynamic vibrator is used to drive a vibrating probe, housed in the vibrometer unit. The probe protrudes through a circular hole in a rigid plate. The force exerted by the patient's finger on the surrounding plate is measured using strain gauges and feedback is provided by the force meter. The probe has a counter-balance providing a constant upward force. These features are unique to the *HVLab* Tactile Vibrometer and ensure maintenance of a controlled contact with the source of vibration.

The software controls and measures the sinusoidal vibration stimulus. The magnitude of the vibration is increased until the patient depresses the response button. The vibration magnitude is then decreased until the patient releases the response button. An automatic test programme repeats this process a number of times to establish threshold levels for perception of different frequencies of vibration. The technique is similar to that used by automatic recording audiometers.



Software

The *HVLab* Tactile Vibrometer software provides the user with a simple menu-driven operating procedure.

User-selected test frequencies

The user may select any sequence of up to 12 excitation frequencies from 16 preferred 1/3 octave centre frequencies between 16 and 500 Hz. The user has a choice of either a pulsed or continuous vibration stimulus.

Automatic recording of thresholds

The vibrotactile thresholds are computed in a manner consistent with British Standard 6655 (1986) for automatic recording audiometers.

Reliability

The reliability of the results at each frequency is checked using criteria defined in British standard 6655. If the reliability of the test is doubtful, the user is automatically given the option of repeating the test at that frequency.

Storage of test results

Patient test results can be stored and recalled together with patient details. A graphical display of a patient's responses is provided together with an option to print a 'vibrogram' for patient files or reports. The software runs on most current PC compatible computers. The *HVLab* Tactile Vibrometer can be supplied complete with it's own PC with the computer interface card already installed.



Technical Details

| | |
|--|---|
| Amplitude range | 0.01 to 50 m/s ² r.m.s. |
| Frequency range | 16Hz to 500Hz |
| Frequency error | less than 0.1% |
| Sampling rate | 4096 samples per second |
| Averaging method | r.m.s. acceleration |
| Amplification/attenuation rates | 1 to 10 dB/s |
| Total harmonic acceleration distortion | less than 5% at 31.5 Hz, less than 2% at 125Hz |
| Length of test | 15 to 120 seconds |
| Power requirements | 220 to 250 V a.c., 100VA (110 to 120 V a.c. option available) |
| Weight of vibrometer unit | 6kg |
| Vibrometer unit dimensions | Height 140mm, Length 550mm, Width 110mm |
| Weight of power supply | 4kg |

Support Facilities

The *HVLab* tactile Vibrometer and control software is supplied with a comprehensive User manual and the use of free Hotline support for the first 6 months.

Further Information ...

The *HVLab* product range includes a thermal aesthesiometer for measuring thermal thresholds, a tactile vibrometer for measuring vibrotactile thresholds, a multi-channel plethysmograph for measuring finger systolic blood pressures and a database for storing test and patient details. For further information:

Human Factors Research Unit, Institute of Sound and Vibration Research, University of Southampton, Southampton, SO17 1BJ.

Telephone: +44 (0) 23 8059 2277; Fax: +44 (0) 23 8059 2927.

e-mail: HVLab@soton.ac.uk web site: <http://www.HVLab.com>