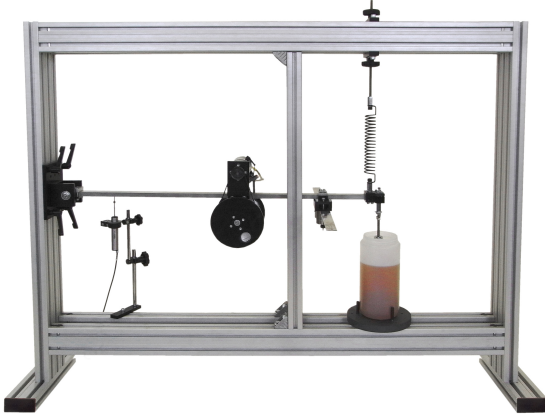




# UNIVERSAL VIBRATION APPARATUS

## HVT12



### 1 study

#### Features

- A comprehensive unit allowing for the study of both free and forced vibration,
- Resonance and Damping
- Excellent visual demonstrator
- Vibration absorber
- Non-contact technology for beam displacement
- Motor exciter for "Forced" vibration
- Data Acquisition System
- Four displacement springs supplied
- Adjustable damping
- Additional options available

#### Description

This system contains all the necessary parts to undertake free and forced vibration, resonance and damping. A beam pivots at one end from a bracket and bearing

attached to the HVT12F Vibration Frame. A spring is attached to the free end of the beam to enable the beam to vibrate. The horizontal position of the spring can be adjusted using the integral adjustment system, and vibration travel is restricted via factory set "stops".

The beam can vibrate freely by displacing the free end by a known amount, or alternatively the beam can be forced to vibrate using the supplied Motor Exciter. The motor exciter has integral imbalanced masses, which when rotated excites the beam to vibrate. The excitation frequency of the beam is controlled using the HAC110 Speed Controller and its output displayed with the HAC90 Tachometer. The excitation frequency and beam displacement are both fed into the HVT12K Data Acquisition System.

Damping can be introduced into the system by using the set of damping discs, damping tank and damping media provided. The damping discs have adjustment which

allows the amount of damping to be altered. A damping absorber is also supplied that attaches to the beam, and can be adjusted to offset the resonance frequency of the system.

A set of calibrated weights is supplied to vary the weight of the vibrating system.

### Related laws

- Characteristics of Vibration
- Single Degree of Freedom
- Natural Frequency
- Resonance
- Newton's Second Law
- Conservation of Energy
- Hook's Law
- Mechanical engineering
- Aeronautical engineering
- Structural engineering

### Learning capabilities

- Spring stiffness
- Resonance frequency
- Active and inactive damping absorber
- Free vibration
- Forced vibration
- Damped vibration
- Damping ratio
- Tuning of damping absorber
- Amplitude response and phase response

### Technical Specification

- Frame measures 1380mm (L) x 1500mm (H) x 310mm (W)
- Beam: 25.4(W) x 12.7(H) x 840(L)mm, coated steel
- Beam: 2.1kg (approx)
- 4 x Springs: spring rates 2.5, 0.75, 1.5, 3.0N/mm
- HAC120 Motor Exciter: Mass 5.1kg (approx)
- HVT12k: Two channel digital oscilloscope with data acquisition software

- 8 x 5N weights
- HVT12D: Spring steel beam: 590(L) x 25.4(W) x 1.6(H)mm

### Recommended Ancillaries

- HVT12A
- HVT12B
- HVT12C

### What's in the Box?

- 1 x Tachometer (HAC90)
- 1 x Speed Controller (HAC110)
- 1 x Motor Exciter (HAC120)
- 1 x Vibration Absorber (HVT12D)
- 1 x Vibrations Frame (HVT12F)
- 1 x Free & Forced Vibrations module (HVT12G)
- Data Acquisitions System (HVT12K)
- 4 x springs
- 8 x 5N weights
- Damping accessory and media
- Tools set
- Instruction manual
- Packing list
- Test sheet

### Supporting Software



All brand and/or product names are trademarks of their respective owners. Specifications and external appearance are subject to change without notice. The colour of the actual product may vary from the colour shown in the brochure.

Copyright © 2018 P.A. Hilton Limited. All rights reserved. This technical leaflet, its contents and/or layout may not be modified and/or adapted, copied in part or in whole and/or incorporated into other works without the prior written permission of P. A.

Hilton Limited. Hi-Tech Education is a registered trade mark of P. A. Hilton Limited.

COUNTRY OF ORIGIN - UK WARRANTY PERIOD - 2 YEARS

- HVT12K

#### **Minimum System Requirements**

- MS Windows XP and above 32bit versions
- Processor 1Ghz
- Memory 512Mb
- Free disc space 2GB
- Ports: USB 1.1 and/or USB 2.0

#### **Weights & Dimensions**

- Shipping Specification: Net Weight: 59Kg
- Length:1580mm
- Height:1270mm
- Width: 940mm

#### **Essential Services**

- Single phase earthed electrical supply 220/240V 50Hz,  
110/120V 60Hz
- Bench top: 1500(L) x 450(W)mm (approx)

#### **Ordering information**

To order this product, please call PA Hilton quoting the following code:

HVT12

All brand and/or product names are trademarks of their respective owners. Specifications and external appearance are subject to change without notice. The colour of the actual product may vary from the colour shown in the brochure.

Copyright © 2018 P.A. Hilton Limited. All rights reserved. This technical leaflet, its contents and/or layout may not be modified and/or adapted, copied in part or in whole and/or incorporated into other works without the prior written permission of P. A. Hilton Limited. Hi-Tech Education is a registered trade mark of P. A. Hilton Limited.

COUNTRY OF ORIGIN - UK WARRANTY PERIOD - 2 YEARS