SV SERIES

Vibration

Universal Vibration System– SD2

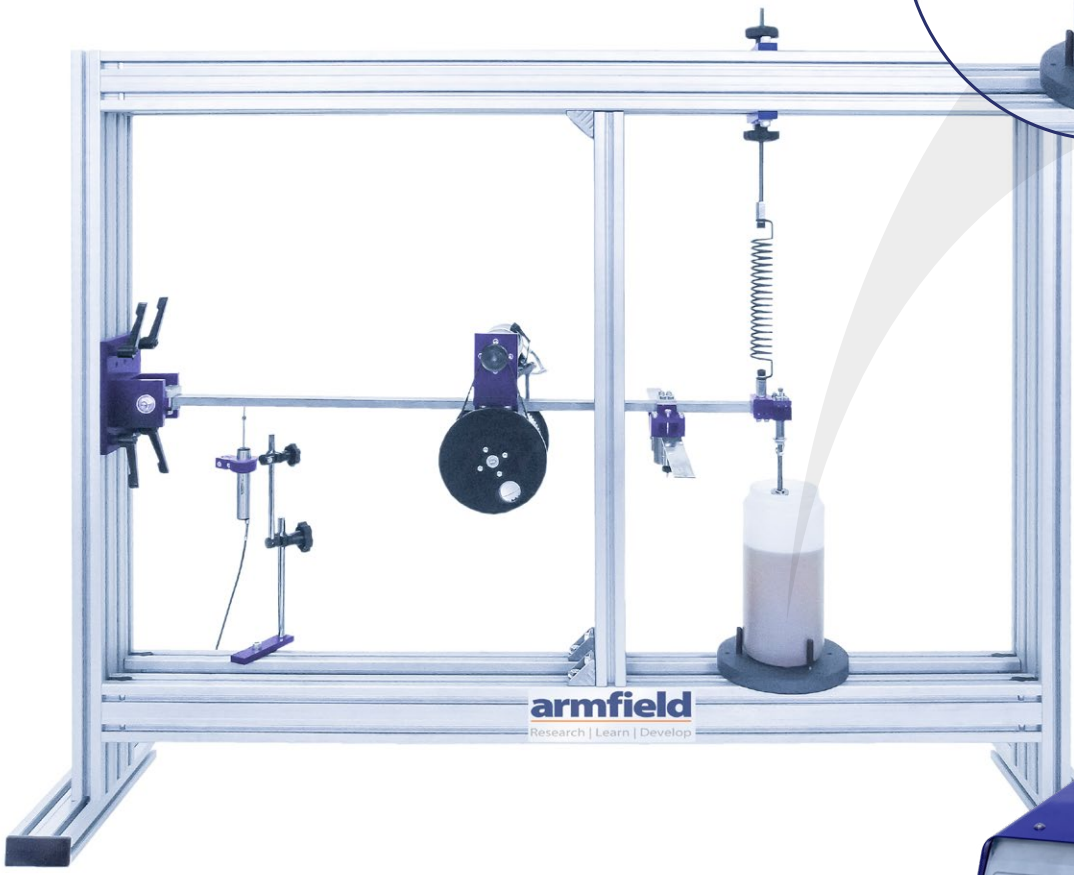
This system contains all the necessary parts to undertake free and forced vibration, resonance and damping.

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.

ALLOWS STUDENTS TO INVESTIGATE FREE AND FORCED VIBRATION, RESONANCE AND DAMPING

SD2: Mechanical Damping



AIU: Armfield Interface Unit

Experimental content

- 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

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Issue: 1
URL: http://www.armfield.co.uk/structures
Applications ME CE IP

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 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 Speed Controller and its output displayed with the Tachometer.

The excitation frequency and beam displacement are both fed into the Armfield Interface unit AIU 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.

Ordering specification

- 1 x Tachometer
- 1 x Speed controller
- 1 x Motor exciter
- 1 x Vibration absorber
- 1 x Vibrations frame
- 1 x Free & Forced vibrations module
- 4 x Springs
- 8 x 5N Weights
- Damping accessory and media
- Tools set
- Instruction manual
- Packing list
- Test sheet (transverse) vibration module

Technical specification

- **Frame measures:** 1380mm (L) x 1500mm (H) x 310mm (W)
- **Beam:** 25.4mm (W) x 12.7mm (H) x 840mm (L), coated steel
- **Beam:** 2.1kg (approx)
- **4 x Springs:** spring rates 2.5, 0.75, 1.5, 3.0N/mm
- **Motor Exciter:** Mass 5.1kg (approx)
- 8 x 5N weights
- **Spring steel beam:** 590mm (L) x 25.4mm (W) x 1.6mm (H)

Overall dimensions

Length	1.580m
Width	0.940m
Height	1.270m
Packed and crated shipping specifications	
Volume	1.23m^3
Gross weight	116kg

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

Requirements

Scale

Electrical supply: 110/120V, 60Hz or 220/240V, 50Hz

- PC with a USB port, running Windows 7 or above

Recommended accessories / equipment

- **SD2-1:** Pendulum Module
- **SD2-2:** Torsional Oscillation Module (Free and Damped)
- **SD2-3:** Beam Bending (Transverse) Vibration Module
- **INST063:** PC USB Oscilloscope

Features / benefits

- 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
- Adjustable damping
- Four displacement springs supplied

Operational conditions

- **Storage temperature:** -10°C to +70°C
- **Operating temperature range:** +10°C to +50°C
- **Operating relative humidity range:** 0 to 95%, non-condensing

Ordering codes

- **SD2:** Universal Vibration System (Includes Tachometer, Speed Controller, Motor Exciter, Vibration Absorber, Vibrations Frame and Free & Forced Vibrations Module)
- **SD2-1:** Pendulum Module
- **SD2-2:** Torsional Oscillation Module (Free and Damped)
- **SD2-3:** Beam Bending (Transverse) Vibration Module
- **AIU:** Armfield Interface Unit **(Supplied with SD2)**
- **INST063:** PC USB Oscilloscope **(Sold separately)**

Armfield standard warranty applies with this product