KSM-049

FREE & FORCED VIBRATION APPARATUS

The **Free & Forced Vibration Apparatus Model KSM-049** is an experimental unit designed for easy assembly on an aluminum double profile frame using slot nuts and clamping levers. The oscillator features a beam mounted on ball bearings at one end, with a helical spring at the other. The system allows various configurations with springs, an exciter, and a damper attached to a perforated panel. Vibrations are generated by either an unbalance exciter or a displacement exciter, with frequency adjustable via an electronic control unit. The displacement exciter can be mounted directly on the spring base, and vibrations can be damped using an adjustable viscosity damper. A mechanical drum plotter records the vibration process over time. The apparatus also includes an amplitude contact with TTL output for triggering stroboscopes. Optional software for data acquisition and a practice set for torsional vibrations are available.

Features

- Fundamental demonstration of mechanical vibration principles
- Analysis of damping effects and resonance in forced vibrations
- Exploration of two excitation principles for vibration generation

Specifications

- Mechanical Vibrations: Basics, natural damped, and forced vibrations
- Bar-type Oscillator: 700x25x12mm, 1.6kg
- Helical Springs: Three types with varying stiffness:
  - 0.75N/mm
  - 1.5N/mm
  - 3.0N/mm
- Unbalance Exciter: DC motor-driven, 0.77kg

Note: Specifications and Photos can be altered without prior notice in our constant efforts for improvement.

- Displacement Exciter: DC motor-driven
- Electronic Control Unit: Digital display with adjustable exciter frequency
- Oil-filled Damper: Variable damper constant from 5 to 15 Ns/m
- Mechanical Chart Recorder: Paper width of 100mm, feed rate of 20mm/s
- Amplitude Meter: Electric contact for triggering equipment

Technical Specifications

- Bar-type Oscillator Dimensions: LxWxH: 700x25x12mm, weight 1.6kg
- Helical Springs:
  - Stiffness: 0.75N/mm, 1.5N/mm, 3.0N/mm
- Exciter Frequency Range: 0 to 50Hz, electronically controlled
- Unbalance Exciter: Unbalance from 0 to 1000mmg
- Displacement Exciter Stroke: 20mm
- Damper Constant: 5 to 15 Ns/m, oil-filled
- Mechanical Recorder: Paper width 100mm, feed rate 20mm/s

Experiment Possibilities

- Natural vibration study
- Dampened vibration investigation
- Exploration of inertia force and displacement excitation
- Forced vibration analysis
- Resonance observation
- Amplitude and phase response measurement

Scope of Delivery

- 1 Frame
- 1 Bar-type Oscillator
- 3 Helical Springs
- 1 Unbalance Exciter
- 1 Displacement Exciter
- 1 Exciter Control Unit
- 1 Oil-filled Damper
- 1 Amplitude Meter
- 1 Drum Recorder
- 1 Storage System with Foam Inlay
- 1 Manual

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