Spring Mass System (Eccentric and Foundation Excitation) (SMT-TM-110)

The Spring Mass Vibrations Apparatus is a bench top mounted unit to analyze the oscillations of a spring mass system. The sturdy bench top base secures two vertical guides in a vertical plane.Atop horizontal bracket keeps the bars at a near constant width.

The near constant width aids the running on a cradle which runs up and down the bars. The cradle runs on integral precision bearings which createsminimal friction. The cradle attaches to one end of a helical tension spring of known wire diameter, free length, spring rate.At the other end of the spring an adjustable screwmechanismadjusts the length of the spring and hence it's starting position. The cradle has its own selfweight, but additionally a number of calibrated weights can be added to the cradle in order to vary the oscillatingmass.The cradle verticalmotion is transferred to a rotating drumrecordermounted with paper.

The oscillations of the cradle can be free or damped. The damped option requires the damper to be attached to the cradle.

TECHNICAL SPECIFICATIONS

Specifications:

- Apparatus to perform vibration testing of helical tension or extension spring.
- Tension spring suspended from bench top frame.
- Suspended mass variable using calibrated weights.
- Start position of spring to be adjustable.
- Mass cradle to run along vertical guides.
- Oscillations of cradle transferred and captured using driven drum recorder.
- Oscillation to be free and damped.
- Damping created using damper.
- Comprehensive technical manual.
- Set of calibrated slotted weights included.

Web: http:// www.esolsengineering.com, Email: esolsengineering@gmail.com

Technical Data:

- Base Frame: Heavy-duty steel frame with rubber anti-vibration mounts; bolted foundation tray.
- Weight: Stackable stainless steel disks: 0.5 kg, 1 kg, 2 kg, 5 kg (Total: up to 15 kg).
- Spring: 4 Interchangeable Steel 100 500 1000 and 1500 N/m
- Motion Axis: Horizontal
- Guidance System: Hardened steel linear shafting with dual-bearing supports (±0.05) mm repeatability).
- Damping Unit: Adjustable oil dashpot (up to 100 Ns/m) Magnetic eddy-current damper with gap adjustment.
- Excitation Methods:
    - Eccentric Mass Excitation: Motor-driven rotating disk with off-center mass Variable-speed motor (0 500 RPM).
    - Foundation Excitation: Vibrating base plate Mounted on shaker (electromagnetic or mechanical cam-driven)
- Sensor:
    - LVDT (±50 mm, 0.01 mm resolution)
    - MEMS Accelerometer (±32 g, single-axis used)
- Measuring Display
    - 10” Touch LCD With GUI (Graphical User Interface)
    - Built in DAQ
    - Real time velocity and frequency
- Safety:
    - Polycarbonate safety shield Mechanical travel limiters Emergency stop.
- Voltage Supply:
    - 230V, 50Hz 1Phase, Power(300W – 2KW).
- Can be used in Research Purposes

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