

Pressure distribution in journal bearing

The trainer covers a wide range of topics in mechanical vibration technology. It is mounted on a sturdy, low-vibration frame which is installed on a laboratory trolley with braked wheels. Quick fastening elements for the formed grooves for quick and accurate experimental set-up. Forced vibration is generated with an electrical motor-driven imbalance exciter. The exciter frequency can be set precisely on a control unit with digital display. An oil damper is used for vibration abatement. A bar-type oscillator that can be adjusted with weights is included for absorber experiments. A mechanical drum and a polar diagram recorder record the vibration. Instructional and experimental vibration system, experiments on damping, resonance, two-weight system and vibration absorption 6 pendulum oscillators, 2 bar-type oscillators, 1 spring mass oscillator electrical imbalance exciter electronic exciter control unit with digital frequency display and TTL output for triggering external units adjustable absorber with leaf spring oil-filled damper. Technical Data : 'Bar, rigid: LxWxH: 700x25x12mm, 1,6kg; Bar, flexible: LxWxH: 25x4x700mm, 0,6kg; Tension / compression springs : 0,75N/mm; 1,5N/mm; 3,0N/mm; Imbalance exciter : 0...50Hz; 100cmg; Oil-filled damper: 5...15Ns/m; Absorber : leaf spring (wxh: 20x1,5mm), total weight: approx. 1,1kg, adjustable 5...50Hz; Groove width of frame: 10mm; Drum recorder: 20mm/s, width 100mm; Polar diagram recorder: D=100mm; Included : Software for Data Acquisition with Technical Description : This data acquisition system is specially designed to evaluate the vibration signals on a PC. This system makes it easy to generate, store and print out frequency and phase response curves. The system provides the important functions of a digital storage oscilloscope and can calculate the frequency spectrums of the signals. The core of the system is the interface box. It supplies power to up to three sensors and processes the measured signals for the PC. It also displays the signals on three analog outputs.

In hydrodynamic journal bearings the shaft and the bearing shell are separated from each other during operation by a lubricating film. The supporting function of the lubricating film in the journal bearing can be described by the pressure distribution in the bearing gap. This unit is used to visualise the axial and radial pressure profile in the journal bearing with hydrodynamic lubrication. To do this, there are 12 measuring points around the circumference of the bearing shell and 4 measuring points in the longitudinal direction. The respective pressures can be read via 16 tube manometers with reference to the height of the liquid column. The journal bearing consists of an electrically driven journal that rotates in a freely movable bearing housing. Oil is used as the lubricant. The displacement of the shaft journal depending on the speed and direction of rotation as well as the characteristic behaviour during start-up can be observed through the transparent bearing housing. Speed and direction can be adjusted. The load can be adjusted by varying the weights supplied with the unit. The temperature in the bearing gap is measured in order to determine the viscosity of the lubricant. Specification : Visualization and investigation of pressure distribution in journal bearings, Bearing housing is completely transparent, Bearing housing moves freely on the rotating journal Infinitely variable speed, electronically controlled, Load on the bearing via set of weight included with the unit, Temperature measurement in the bearing housing radial and axial pressure distribution indicated with 16 tube manometers, Digital display for speed on the display and control unit.

Technical Data :

Bearing : nominal bearing diameter: 51mm, bearing gap: 4mm, bearing width: 75mm, bearing load: 6,7...16,7N; Motor : power: 0,37kW, max. speed: 3000min; Oil ISO viscosity grade: VG 32; Tank for oil: 2,5L; Set of weights : 1x 1N (hanger), 2x 2N, 1x 5N; Measuring ranges : pressure: 1770mm oil column, temperature: -10...50°C, speed: 0...3000min