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# MECHANICAL ENGINEERING LAB EQUIPMENTS

DYNAMICS OF MACHINE LAB











#### LABTEK COVERS THE FOLLOWING LABORATORY:

- STRENGTH OF MATERIAL LAB
- > THERMAL ENGINEERING LAB
- ➢ FLUID MECHANICS LAB
- DYNAMICS OF MACHINE LAB
- ➢ HEAT TRANSFER LAB
- ➢ FLUID MACHINERY LAB
- ▶ REFRIGERATION AND AIR-CONDITIONING LAB
- > AUTOMOBILE ENGINEERING LAB
- ➢ APPLIED MECHANICS LAB
- ➢ CAM LAB
- ≻ M&ILAB
- DATA ACQUISITION LAB
- ➢ MECHATRONICS LAB.

The company lays special emphasis on export of its products all over the world, hence has a correct knowhow of resenting product and its instruction manual in printed and soft format accepted internationally.

#### WELCOME TO LABTEK TECHNICAL CATALOG

Established in 1999, LabTek has built a solid reputation for manufacturing and marketing laboratory equipment with strong mechanical base required in universities, engineering colleges, polytechnics, vocational schools etc. LabTek has a selection of more than 500 mechanical engineering and 800 civil engineering equipments and test rigs. With customers spread across the globe, LabTek is regarded as premier supplier of reliable, high quality and competitively priced products. We provide Turnkey solution for establishing mechanical and civil engineering laboratory with state of the art technology and solution.

#### R & D & QUALITY ASSURANCE:

Our R & D Engineers work in close contacts with clients to produce user friendly products and manuals providing a fulfilling teaching and learning experience. Students can complete their assignments in single laboratory session.LabTek operates a continual product improvement process through ISO procedures and customer feedback to ensure that our product stays ahead of the competition and meets customer needs. Our product specifications are reviewed in line with worldwide curriculum to comply varied syllabus requirements and hence regularly updated and new products developed.

#### AFTER SALES SERVICE

Company responds to customer needs quickly and considers after sales service equally important to establish a culture of customer confidence, LabTek has established long term relationships with its clients. To expedite your order or to get any particular service, please send us an e-mail or fax with product details and your contact address along with mobile /landline numbers. Our Service Engineers will respond to you quickly through email/phone. We also provide installation, commissioning and training service for any customers who require assistance.

The largest established manufacturing, trading and export house of quality Technical Education Lab Equipments in INDIA



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## LAB & EQUIPMENTS NAME

#### DYNAMICS OF MACHINE LAB

Whirling of Shaft Apparatus Vibration Lab Apparatus Motorized Gyroscope Universal Governor Apparatus Static and Dynamic Apparatus Cam Analysis Apparatus Journal Bearing Apparatus Epicylic Gear Apparatus

Corollis Component of Acceleration





#### WHIRLING OF SHAFT APPARATUS

This compact and simple apparatus incorporated two features. Firstly, kinematics coupling at the driven end of the shaft to slide freely in longitudinal direction while revolving readily. The directional clamping of this end of the shaft is achieved by and interchangeable chuck without self aligning radial ball bearing.

The shaft is driven through a dynamically balanced flexible coupling by a universal motor, the speed of which can be controlled by a control unit. The speed of rotation of the shaft can be measured by a stroboscope. Tachometer can be also used for speed measurement. The following shafts made from steel will be supplied.

Dia. (MM)	Length (MM)
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2 or 3	10000
4	10000
6	10000
8	10000

One kinematics coupling and bearing for fixed of fee end. One sliding chuck for fixed end with lateral movement.

POWER REQUIREMENT

220 V, 50 Hz single phase

Range of experiments: Investigation of various models of whirl for shafts with:

a) Both ends directionally fee.

b) Both ends directionally fixed

Note: STROBOMETER AND TACHOMETER NOT INCLUDED IN THE SCOPE OF SUPPLY.



#### **VIBRATION LAB APPARATUS**

#### Vibration Lab- No I:

Vibration lab machine for performing experiments on longitudinal and torsional vibrations with control panels and speed indicators. Exp. 1-Equivalent spring mass system to study the undamped free vibration.

Exp. 2- Equivalent spring mass system to study forced calibration

#### Vibration Lab- No II:

Vibration lab machine for performing experiments on longitudinal and torsional vibrations with control panels and speed indicators.

- Exp.1-Simple pendulum
- Exp. 2- Compound Pendulum
- Exp. 3-Bifiler suspension
- Exp. 4- Spring mass system
- Exp. 5- Equivalent spring mass system to study the undamped free vibration
- Exp. 6- Equivalent spring mass system to study forced calibration.
- Exp. 7- Verification of Dukerley's rule
- Exp. 8- To study of force vibration for various amount of damping.
- Exp. 9-Torisional vibration for the single rotor system
- Exp. 10- Torisional vibration for the two rotor system
- Exp. 11- Single rotor with viscous damping

#### **MOTORIZED GYROSCOPE**

This is to demonstrate the relationship between applied torque and the rate and direction of rotation. This is motorized and mounted on a frame such that free to rotate about three perpendicular axis. This facilitates to observe the laws of stability and justification of equation.







**Static and Dynamic Apparatus** 

#### **UNIVERSAL GOVERNOR APPARATUS**

The set up consists of a small electric motor connected bevel reduction gear box or belt and pulley system through a flexible coupling. The Governor spindle is driven by a solid coupling connected to the gear box output shaft and is supported on ball bearing. The optional governor mechanism can be mounted on spindle. Speed control unit is provided to regulate speed and extension to the spindle shaft can be sued to use hand tachometer. The center sleeve to the porter and proell governors incorporates a weight sleeve to which weights are added. The Hartnell Governor can be operated as a stable or unstable Governor.

The following range of experiments can be Performed:

- a) The effect of varying mass of the center sleeve.
- b) The effect of varying the rotating mass.
- c) Determination of characteristic curves of sleeve position against speed of rotation.
- The effect of varying the initial spring compression.



**Cam Analysis Apparatus** 

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#### **STATIC AND DYNAMIC APPARATUS**

This is suitable for conducting experiments on static balancing and dynamic balancing with different weights. This consists of rectangular frame of steel perfectly balance with four different blocks. A protractor scale of the disc is provided to reach exact angular position of each weight to be measured. A linear scale provided below the frame provides the measurement of each weight along the shaft. The unit is hanging from a rigid steel frame through chain for dynamic balancing and can be fixed rigidly for static balancing.

#### **CAM ANALYSIS APPARATUS**

The machine facilitates the study of dynamic behavior of cam follower. It consists of a DC Motor coupled to an extension shaft whose and carries a cam. A cam follower, mounted on the end of a vertical bar, is loaded on the cam face by compression spring is retained by a cross bar mounted on two vertical pillars attached to the base plate. Facility is provided to vary the pre compression of spring. The inertia of follower can be altered using weights.

Note: Motor is provided only to demonstrate the actual water of system. However while drawing the graph the motor shall be





#### **Epicylic Gear Apparatus**

#### JOURNAL BEARING APPARATUS

The Equipment shall have following test facility:

- 1) Simple Demonstrations Observation of the pressure profile
- at the various conditions of load and speed
- 2) Experimental Investigation After noting the pressure profile for any chosen conditions the following analysis may be conducted. Plotting the Cartesian and polar pressure curves Parts/Component Details:
- 1) Journal 50 mm diameter (Nominal)
- 2) Bearing 55 mm diameter
- 3) Weights 4 adjustable weights.
- 4) Recommended oil SAE 10
- 5) DC Motor with speed 150-1500 rev/min in both the direction
- 6) Suitable speed Control Unit is provided along with apparatus
- 7) Manometer Panel 16 tubes mounted on a wooden backboard



**Corollis Component of Acceleration** 

#### **EPICYLIC GEAR APPARATUS**

The Equipment shall have following facility:

- 1) To measure epicyclic gear ratio between input Shaft and output shaft.
- 2) To measure epicyclic gear ratio between input shaft and holding drum.
- 3) To measure input torque, holding Torque and output Torque Parts/Component Details:
- A) External Type Epicyclic Gear Train.
- 1) Bearing blocks for input and output Shafts are mounted on on a base frame.
- 2) A gear Train with Holding drum and a handle.
- B) Internal Type Epicyclic Gear Train:
- 1) A compact Gear Train (Industrial)
- 2) Variable Speed D.C. Shunt Motor, 1hp 1500rpm, 230 volts.
- 3) Rope brake arrangement to measure output torque and holding torque.
- C) Control Panel consisting of Digital Ammeter and Voltmeter RPM Indicator, on off switch. Speed control unit

#### **COROLLIS COMPONENT OF ACCELERATION**

Coriolli's components of Acceleration can be determined at various speeds of rotation at water flow rates. Parts/Component Details:

- 1) Main Tank Fabricated out of fiberglass plastic sheet.
- 2) Rotating Arms 9 mm/ 6mm orifice diameter, 300mm logn.
- 3) Rotameter 300 to 3000 LPH
- 4) Electrical Motor D C. Swinging field, 0.5 H.P. 1500 RPM.
- 5) Mono-block Pump Single phase, pump with Motor 2400 LPM discharge.
- 6) Control Unit consisting ofa) pump switch, b) Speed Control, c) Speed Indicatord) Main Switch.
- 7) Rigid Support Structures



## **MODELS OF DIFFERENT TYPES OF GEAR TRAINS**







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### **MODELS OF DIFFERENT TYPES OF GEAR TRAINS**









Experience The Difference LABTEK Website: www.labtekindia.com

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#### QUALITY POLICY

The Management and the staff of LabTek is committed to provide Educational training equipments and test & measurement products and services on par with international standards with and emphasis on cost effectiveness, customer satisfaction and market coverage. It is our endeavor to create a culture of total quality where continuous improvement of our products by increasing involvement of people through customer oriented, flexible, multiple job functions with emphasis on cost consciousness becomes a way of life.

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## Sun LabTek Equipments (I) Pvt. Ltd.

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