KFM-13

CENTRIFUGAL PUMP TEST APPARATUS

Centrifugal pumps are widely used for pumping liquids in several applications including domestic, industrial, irrigation and drainage. Energy is supplied to the pump by an electric motor and the potential energy of the liquid is increased by the action of the impeller rotating inside a volute casing. It is essential for students to understand the operation and performance characteristics of centrifugal pumps. The **Centrifugal Pump Test Apparatus Model KFM-13** is an experimental set-up necessary for any Fluid Mechanics and Hydraulics Laboratory of an educational institution.

The **Centrifugal Pump Test Apparatus Model FM-13** has been designed to enable students to study the operation and performance characteristics of a typical centrifugal pump. The module consists of a variable speed centrifugal pump assembly having an independent discharge manifold interconnected by plastic tubing with quick release connectors. The pump is driven by a DC shunt wound motor of adjustable speed. The motor is suspended and the driving torque is determined with a torque wrench. The motor speed and power consumption are digitally displayed on the control panel. The pump can be connected to the FM00 hydraulic bench or any other hydraulic bench models to supply and re-circulate water. Bourdon tube pressure gauges are mounted at the inlet and exit of the pump to measure increase of head across the pump. The independent discharge manifold has a pressure gauge and a flow control valve upstream of the discharge pipe and the diffuser. The flow rate through the system is measured using the measuring tank of the hydraulic bench and can be checked independently by the water flow meter fixed in the discharge.

The **Centrifugal Pump Test Apparatus** is a compact unit and all components and instrumentation are placed in a robust and mobile frame. The complete unit is manufactured from corrosion resistant material.

OPTION:
Computer based learning software is included to enable students understand and conduct experiments, tabulate results and plot graphs. The Centrifugal Pump Test Apparatus is an important experimental set-up for any Fluid Mechanics and Hydraulics Laboratory of an educational institution

Experiments:

Series or Parallel Centrifugal Pump Operation:

1. Study of the operation and working of centrifugal pump.
2. Determination of power requirement of the pump.
3. Determination of the hydraulic power output of the pump.
4. Investigation of the performance and characteristics of centrifugal pump :
   a. The effect of pump speed.
   b. Head, discharge, speed, power and efficiency curves.
   c. Non-dimensional performance curves.
   d. Determination of specific speed.
   e. Determination of net positive suction head.

Important Features and Specifications

- Centrifugal pump size- 25.4 mm x 25.4 mm (Approx), Discharge: 15-30 lpm at 30 meter (Approx), Total head: 12 meter (Approx).
- Driving Motor: ½ HP, DC electric motor
- Power Measurement
- RPM Indicator with sensor, Range - 0 to 9999
- Pressure Gauges: 5 Kg/ Sq. cm.
- Vacuum Gauge: 760mm (approx)
- Foot Valve: size: 1” (approx) Plastic
- Energy meter

Note : Specification & Photos can be altered without notice in our constant efforts for improvement

- Stand: M.S. Structure with powder coating.
- Measuring Tank: 40 Liter non Corrosive PVC/Acrylic tank
- Mechanical level measurement facility with scale.
- Sump Tank: 100 Liter non Corrosive PVC/FRP tank
- Stop Watch.
- Piping & fittings & valves.
- Flow measurement facility.

Measurements:

- Power input to the motor.
- Torque and power input to pump.
- Pump rotational speed.
- Pump suction and delivery pressures.
- Flow rate.

Options

- A self contained unit of the Centrifugal Pump Test Apparatus consisting of a flow discharge measurement tank and a sump tank made of FRP or corrosion resistant sheet metal for use in case the hydraulic bench is not available with the user can be supplied on request.
- Computer compatible Centrifugal Pump Test Apparatus having electronic transducers for pressure, flow rate and rotational speed measurements can be supplied on request.

Services Required

- Single phase electrical supply, 220-240 V, 50 Hz.
- Water supply and drainage.

Overall dimensions:

- Length : 1200mm.
- Width : 600mm.
- Height : 800mm.

The manual describing the theoretical and practical aspects of the apparatus, operation, analysis of results, and sample of results will be supplied with the equipment.

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