



Study of pressure loss in pipes is important in view of the loss of head due to friction and consequent pumping power requirements in any pipe system. The Tesca Pressure Loss in a Pipe Apparatus is an experimental set-up necessary for any Fluid Mechanics and Hydraulics Laboratory of an educational institution.

The Tesca Pressure Loss in a Pipe Apparatus has been designed to enable students to measure loss of head due to friction in a pipe and to study the effect of change in flow velocity. Laminar and turbulent flow regimes can be obtained by varying the flow velocity and hence the flow Reynolds number. The apparatus consists of a horizontal test pipe with static pressure tapings at the upstream and downstream ends to measure head loss due to friction. Extra pipe lengths are provided at the inlet and exit to allow the flow to become fully developed and to damp out the flow disturbance originating from the valves and fittings. The test pipe is mounted on a support frame and there is a provision for leveling. Water is supplied from the hydraulic bench (for higher flow rates) and the constant head feeding tank (for lower flow rates). Pressure drop along the test pipe length is

measured using the U-tube mercury manometer or the pressurized water manometer depending upon the flow velocity. These manometers are mounted on a display panel with calibrated scales. The flow rate and hence the velocity through the test pipe is controlled by a regulation valve at the exit and the flow rate is measured by the flow meter or the measuring tank of the hydraulic bench. Experiments can be conducted at various flow velocities or Reynolds numbers to obtain pressure loss in laminar or turbulent flow regimes. The complete unit is manufactured from corrosion resistant materials. The 32096 Hydraulic Bench or any other standard hydraulic bench models can be used to supply water.

Option:

Computer Based Learning Software is included to enable students to understand and conduct experiments, tabulate results and plot graphs. The Tesca Pressure Loss in a Pipe Apparatus is an important experimental set-up for any Fluid Mechanics and Hydraulics Laboratory of an educational institution.

Experiments

1. Study of loss of head due to friction in a circular pipe at various mean flow velocities.
2. Study of friction factors in laminar and turbulent flow regimes.
3. Demonstration of the law of resistance in laminar to turbulent flow regimes.

Note: Specifications are subject to change.

Tesca Technologies Pvt. Ltd.

IT-2013, Ramchandrapura Industrial Area, Sitapura Extension,
Near Bombay Hospital, Vidhani Circle, Jaipur-302022, Rajasthan, India,
Tel: +91-141-2771791 / 2771792; Email: info@tesca.in, tesca.technologies@gmail.com
Website: www.tescaglobal.com

4. Establishment of critical Reynolds number.
5. Comparison of experimental results with the well known Moody's diagram.

Important Specifications:

1. Test pipe, 3mm bore, 650mm long with two static pressure taps at 500mm apart.
2. Feeding tank, capacity: 10 liters, constant water head : 900mm.
3. Mercury U-tube manometer, range : 500mm.
4. Pressurized water manometer, range: 500mm.
5. Flow meter, range: 2lpm.
6. Ancillaries include measuring cylinder (1 liter capacity), hand pump and a sample of test pipe (100mm long).

Options

1. A self contained unit of the Pressure Loss in a Pipe Apparatus mounted on a mobile platform and with a flow controlled closed circuit water circulation unit consisting of centrifugal pump, flow meter, corrosion resistant sheet metal measuring tank and a sump tank will be supplied on request.
2. A digital pressure meter can be supplied as an alternative to the mercury U-tube manometer on request.

Services Required:

1. Water supply.
2. Electrical supply, 240 V, single-phase, 50 Hz.

Overall Dimensions

Height : 1.2m, Width : 0.4m, Length : 0.9m.

Instruction Materials

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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