The sum of pressure head and velocity head is constant along a horizontal streamline in a steady, inviscid and incompressible flow of fluid. The Tesca Pressure Distribution in Venturi Nozzle Apparatus is a bench top unit and has been designed to measure the variation of static pressure and flow velocity in pipe flow having venturi and nozzle. The apparatus consists of a transparent venturi tube and nozzle mounted in a horizontal pipe line. Wall pressure tappings are provided along the converging and diverging portions of the venturi and nozzle surface to measure the static pressure variation. Pitot probes are provided at suitable locations along the centre line of the venturi and nozzle to measure total head. Static and total pressures are measured using a multi-tube manometer having a manifold with an air bleed valve. Manometer can be pressurized by a hand pump. Flow meter is provided to measure flow rate.

This apparatus can also be used to conduct laboratory experiments to (a) demonstrate continuity and Bernoulli's equations and (b) determine the coefficient of discharge of venturi and nozzle to use as flow measurement devices. The 32096 Hydraulic Bench or any other standard hydraulic bench models can be used to supply water. Water is supplied by a hose connection at the inlet and controlled by a valve at the outlet. The complete unit is manufactured from corrosion resistant materials.

OPTION:

Computer based learning software is included to enable students to understand and conduct experiments, tabulate results and plot graphs. The Tesca Pressure Distribution in Venturi Nozzle Apparatus is an important experimental set-up for any Fluid Mechanics and Hydraulics Laboratory of an educational institution.

Following is the list of experiments that can be carried out using the Bernoulli's Theorem Demonstration Apparatus:

Note: Specifications are subject to change.

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1. Familiarization with static and total pressure measurements.
2. Demonstration of continuity equation.
3. Demonstration of Bernoulli's theorem.
4. Measurement static pressure variation along the venture and nozzle at different flow rates.
5. Study of flow velocity variation along the venturi and nozzle.
6. Determination of Hydraulic Gradient Line and Energy Gradient Line.
7. Determination of coefficient of discharge of the venturi and nozzle.
8. Study of venturi and nozzle as flow measurement devices.

Measurements:

1. Static pressures along the venturi.
2. Total pressures along the venturi.
3. Volume flow rate from Hydraulic Bench or flow meter.

Important Features and Specifications:

1. Venturi, transparent, made of clear Acrylic and having convergent and divergent portions, throat diameter: 12.0mm, maximum diameter: 25mm, upstream taper: 150, downstream taper: 60.
2. No. of static pressure taps in venturi: 7.
3. No. of Pitot probes in venturi: 7.
4. Nozzle, transparent, made of clear acrylic, throat diameter: 12.0mm, maximum diameter: 25mm.
5. No. of static pressure taps in nozzle: 4.
6. No. of Pitot probes in nozzle: 4.
7. Flow meter
8. Multi-tube manometer, 0-300 mm water column, No. of tubes: 8.

Option:

A self contained unit of Pressure Distribution in Venturi Nozzle Apparatus mounted on a mobile platform 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.

Services Required:

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

Overall Dimensions (Including the Hydraulic Bench)

- Height: 1.35m, Width: 0.75m, Length: 1.4m.
- 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.

Note: Specifications are subject to change.

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