Osborne Reynolds' Demonstration Apparatus (EDC-FM-107OR)

EXPERIMENTAL DATA:

- Demonstration of transition between turbulent and laminar flow
- Determination of transition Reynolds number and comparison with accepted values

DESCRIPTION:

The apparatus consists of a Visualization of laminar and turbulent flow in the Osborne Reynolds experiment. Water as flowing medium and ink as contrast medium. Vertical glass pipe section. Water tank with glass beads to stabilize the flow. Flow rate in the pipe section can be adjusted via a valve. Flow rate determined by the base module. Water supply using the base module or via laboratory supply, Flow visualization using prepared CFD simulations, Digital multimedia teaching material online in the Media Center: E Learning course, prepared CFD simulations, worksheets, videos.

This experimental unit consists of a precision-bore glass pipe held vertically. The constant head tank is made of transparent acrylic. This allows the students to see the flow clearly. Water enters a constant head tank (reservoir) above the test tube and passes through a stilling bed. It then passes through a specially shaped bell-mouth into the test tube. This arrangement ensures a steady, uniform flow at entry to the test tube. A thermometer measures the temperature in the constant head reservoir.

A fixed overflow pipe in the reservoir connects to a suitable drain. At the bottom of the test pipe is a valve which controls the flow rate through the pipe, without disturbing the flow.

Students collect a known quantity of water in a measured time to find the flow rate. Included is a measuring cylinder. To see the pattern of flow in the pipe, students use a dye injector (included). They use it to inject a fine filament of dye into the top of the tube.

The base of the apparatus has adjustable feet for levelling prior to use with the included levelling device.

TECHNICAL DATA:

Water Tank:

- Capacity: 2200mL
- Contains glass beads for flow stabilization

Pipe Section:

- Length: 675mm
- Inner diameter: Ø10mm

Ink Tank:

- Capacity: 250mL

Measuring & Flow Control:

- Water flow adjustable via valve
- Flow rate determined by the base module
- Compatible with laboratory water supply

SCOPE OF DELIVERY:

- 1 experimental unit
- 1 bag of glass beads
- 1L ink
- 1 set of instructional material
- 1 online access to the Media Center

DIMENSIONS AND WEIGHT:

- Minimum size: 400 x 400 x 1140mm (L x W x H)
- Maximum weight: 16kg