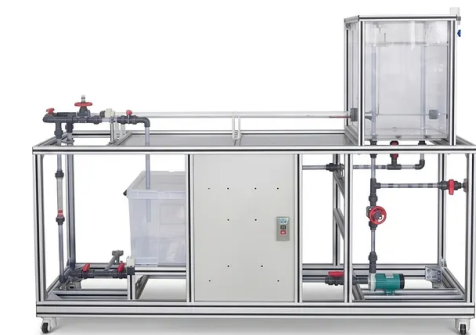


Fluid Reynolds Number Demonstration Educational Unit

Operations Pilot Plant

Item Number: LPK-BRE



Introduction

Visual fluid dynamics pilot plant for engineering education demonstrating laminar, transitional, and turbulent flow regimes via dye injection in circular conduits. Verifies Reynolds number transitions and teaches dimensionless analysis. Modular design with digital simulation software enhances hands-on learning

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System Feature / Module	Technical Details & Components	Educational Target & Textbook Mapping
Flow Regime Demonstration Module	Precision glass/acrylic test pipe with a micro-injection dye needle and reservoir.	Observation of laminar lines, transitional wave-like disturbances, and turbulent dispersion.
Stabilization Water Tank	Custom-designed constant-head tank with internal baffles to eliminate inlet turbulence.	Demonstrates the importance of steady-state inlet conditions in fluid mechanics experiments.
Flow Control & Measurement	Calibrated rotameter, needle control valves, and volumetric discharge measuring system.	Quantitative determination of flow rate, average fluid velocity, and calculation of experimental \$Re\$.
Chassis & Structural Frame	Industrial-grade aluminum alloy profile frame with lockable casters; Max dimensions: 2200mm x 580mm x 1780mm.	Demonstrates industrial piping and frame layout practices to engineering students.
Digital Simulation Software	Interactive 3D visualization and process animation of internal fluid pathways.	Complements hands-on trials by demonstrating structural features not easily visible from the exterior.