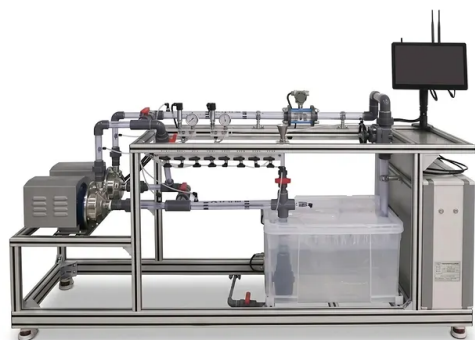


Centrifugal Pump Performance Determination Educational Unit Operations Pilot Plant

Item Number: LPK-LXBZH



Introduction

This lab system determines centrifugal pump performance curves for unit operations. Students configure dual pumps in series or parallel for hands-on learning. Includes industrial controls, clear piping, and data logging. Customizable for chemical, mechanical, and environmental engineering programs.

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System Component / Parameter	Specification / Description
Pumping System	Two corrosion-resistant stainless steel centrifugal pumps, configurable for individual, series, or parallel operation.
Fluid Reservoir	High-capacity transparent water tank with integrated drain and suction fittings.
Instrumentation	Industrial pressure transmitters at pump suctions and discharges; electromagnetic or turbine flowmeter; power transducers for pump motor power measurement.
Control Interface	Industrial touch-screen computer terminal mounted on the frame, supporting real-time data visualization and remote operation.
Piping & Valves	Clear process piping with manual flow control valves and configuration-switching valves.
Framework	Heavy-duty, mobile aluminum alloy frame with locking casters.

Experimental Module	Key Concepts Addressed	Textbook Reference & Core Topics
Single Pump Performance Curve Determination	Pump head (H), shaft power (N), overall efficiency (η), volumetric flow rate (Q), and characteristic curves.	<i>Unit Operations of Chemical Engineering</i> - Fluid statics and its applications - Transportation of fluids - Centrifugal pump characteristics and NPSH
Pumps in Series Configuration	Head addition at constant flow rate, system operating points, and energy efficiency.	<i>Transport Processes and Unit Operations</i> - Momentum transfer and fluid flow - Flow of incompressible fluids in conduits - Pumps and gas-moving equipment
Pumps in Parallel Configuration	Flow rate addition at constant head, combined performance curve construction, and system resistance matching.	<i>Chemical Engineering Design</i> - Piping design and pump selection - Hydraulic analysis of process piping - Utilities and energy conservation