Multi-Functional Special Distillation Educational Pilot Plant

Item Number: LPK-SDMC

Introduction

Versatile multi-functional special distillation pilot plant for chemical engineering education. Supports continuous, vacuum, azeotropic, reactive, extractive distillation. Transparent glass columns enable real-time visual observation of hydrodynamics and separation processes.

Learn More

Experimental Module / System Component	Technical & Operational Specifications	Associated Textbook Concepts & Unit Operations
Column Assembly & Packing	Double transparent glass columns; insulated outer walls; configurable with structured or random packing; 3–5 side ports per column for multi-point sampling and feed tray selection.	**Chemical Engineering Design**: Packed column hydraulics, HETP (Height Equivalent to a Theoretical Plate) calculations, feed tray optimization, and column internal selection.
Continuous & Vacuum Distillation System	Integrated vacuum pump, pressure gauges, and digital reflux ratio controller adjustable from 1 to 99.	**Unit Operations of Chemical Engineering**: McCabe-Thiele method, reflux ratio optimization, boiling point elevation, and vacuum distillation calculations.
Azeotropic & Extractive Distillation Modules	Dual feeding pumps with auxiliary solvent/entrainer introduction systems; precise temperature-controlled reboilers.	**Transport Processes and Unit Operations**: Vapor-Liquid Equilibrium (VLE) modifications, separation of close-boiling systems, and the selection criteria for solvents/entrainers.
Reactive Distillation Module	Dedicated catalytic packing zone with integrated temperature sensors to monitor exothermic/endothermic profiles.	**Unit Operations of Chemical Engineering**: Simultaneous mass transfer and chemical reaction, shifting chemical equilibrium, and reaction conversion enhancement.