

Dual-Mode Rectification Pilot Plant For Practical Training Unit Operations

Item Number: LPK-SMTJL



Introduction

Industrial-scale dual-mode rectification pilot plant for chemical engineering practical training. Features real-material and simulated-material operation modes, sieve-plate column with sight glasses for visual observation of hydrodynamics, and customizable SCADA control for safe, hands-on learning of unit operations and mass transfer.

[Learn More](#)

Parameter	Specification
Column Type	Sieve-plate column with single-pass downcomer and integrated sight glasses
Operating Modes	Dual-mode: Real-Material (active process) & Simulated-Material (model-driven with water/air)
Structure Layout	Two-tier industrial steel platform with yellow guardrails (1.2m height) and safety staircase
Platform Decking	3mm carbon steel non-slip checkered plate
Control System	PC-based SCADA software with real-time data acquisition, parameter adjustment, and safety interlocks
Key Instrumentation	Flowmeters (rotameters), temperature transmitters, pressure sensors, and liquid level gauges
Auxiliary Equipment	Feed pre-heater, reboiler, overhead condenser, reflux divider, distillate and bottoms collection vessels
Overall Dimensions	Standard footprint of 3930 mm × 2560 mm × 3900 mm (customizable to laboratory ceiling heights)

Textbook Reference	Relevant Unit Operations & Theoretical Concepts
<i>Unit Operations of Chemical Engineering</i>	Fractional distillation, McCabe-Thiele method for calculating theoretical stages, column tray efficiency, reflux ratio effects, and plate column hydrodynamics (weeping, flooding, and loading).
<i>Transport Processes and Separation Process Principles</i> (formerly <i>Transport Processes and Unit Operations</i>)	Vapor-liquid equilibrium (VLE), multicomponent mass transfer, continuous rectification, and heat/mass balances over distillation columns and condensers.
<i>Chemical Engineering Design</i>	Pilot-scale process design, instrumentation and control loops, equipment scaling, and process safety standards within pilot plant operations.