

# Bench Scale Dual Column Gas Separation And Capture Educational Pilot Plant

Item Number: LPK-CQBJ



## Introduction

This dual-column educational pilot plant provides hands-on teaching of gas adsorption, separation, and capture processes. It features stainless steel columns, regeneration up to 400°C, and a 15.6-inch touchscreen PLC for TSA and PSA studies in chemical engineering curricula, process simulation.

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| Technical Parameter       | Specification / Range                                        | Associated Educational Module                          | Corresponding Academic Concept                                     |
|---------------------------|--------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------|
| <b>Separation Columns</b> | Dual-column configuration, stainless steel, easy disassembly | Gas separation efficiency; breakthrough curve analysis | Mass transfer zones, adsorption equilibrium, and selectivity       |
| <b>Regeneration Temp.</b> | Adjustable up to 400°C with integrated heating jackets       | Thermal Swing Adsorption (TSA) studies                 | Desorption kinetics and thermal regeneration energetics            |
| <b>Pressure Control</b>   | Multi-range digital pressure sensors with safety valves      | Pressure Swing Adsorption (PSA) simulation             | Adsorption isotherms and system pressure dynamics                  |
| <b>Flow Management</b>    | High-precision mass flow controllers                         | Flow rate influence on separation breakthrough         | Superficial velocity, residence time, and mass transfer resistance |
| <b>Control System</b>     | 15.6-inch touchscreen PLC, wireless transmission             | Automated process control and data acquisition         | Process dynamics, loop control, and digital data logging           |