

Side By Side Dual Station Vacuum Glove Box Inert Gas Purification System For Battery R And D And Materials Science

Item Number: ST06



Introduction

This side by side dual station vacuum glove box provides an ultra clean inert gas environment with moisture and oxygen levels below 1 ppm, featuring automated Siemens PLC control, dual antechambers, and robust 304 stainless steel construction for battery research.

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Application	Description	Key Benefit
Solid-State Battery R&D	Assembly, encapsulation, and electrolyte filling of air-sensitive lithium/sodium metal cells and sulfide-based solid electrolytes.	Eliminates hydrolysis and oxidation risks by maintaining sub-1 ppm moisture and oxygen baseline environments.
Organometallic & Catalysis Synthesis	Synthesis, purification, and storage of reactive catalysts, Grignard reagents, and pyrophoric transition metal complexes.	Prevents spontaneous decomposition and catalyst deactivation with continuous closed-loop inert gas scrubbing.
Perovskite Photovoltaics Processing	Spin-coating, thermal annealing, and encapsulation of high-efficiency perovskite solar cells and quantum dots.	Guarantees batch-to-batch film morphology consistency in a solvent-managed, dust-free enclosure (0.3 µm HEPA filtration).
Supercapacitor & Battery Slurry Prep	Handling ionic liquids, volatile organic electrolytes, and conductive carbon additives in experimental supercapacitor fabrication.	Heavy-duty solvent vapor trap captures hazardous electrolyte outgassing, preserving catalyst longevity.
Powder Metallurgy & Additive Manufacturing	Handling reactive spherical powders (Titanium, Aluminum, Magnesium alloys) for selective laser melting (SLM) preparation.	Prevents powder oxidation, ignition risks, and moisture pick-up to maintain optimal powder flowability and purity.
Semiconductor & OLED Device Packaging	Deposition handling, wafer transfer, and hermetic encapsulation of organic light-emitting diodes and microelectronics.	Ultra-low leakage rate (<0.05 vol%/h) and precision vacuum antechamber transfers eliminate particle and gas contamination.

Subsystem / Metric	Specification Parameter	Value / Detail
Product Identifier	System Model / Item Number	ST06
Overall Configuration	Operation Mode / Layout	Side-by-side dual-station, single-side operation with integrated single-column purification unit
Atmosphere Performance	Moisture & Oxygen Purity Level	< 1 ppm (at 20°C, 1 atm, 99.999% inert gas supply)
	Chamber Leakage Rate	≤ 0.05 vol%/h
Main Enclosure	Internal Dimensions (L × D × H)	2440 mm × 750 mm × 900 mm
	Structural Material & Thickness	304 Stainless Steel, 3 mm wall thickness
	Interior / Exterior Finish	Brushed stainless steel interior / White electrostatic powder-coated exterior
	Viewing Windows	2× Inclined transparent tempered safety glass panels, 8 mm thickness, laminated with protective film
	Glove Ports & Gloves	4× Polyoxymethylene (POM) ports with O-ring seals; 2 pairs 0.4 mm thick, 8" diameter, 32" length North butyl rubber gloves
	Gas Filtration	Dual 0.3 µm HEPA filters (1× gas inlet, 1× gas outlet)
	Shelving & Illumination	Built-in 2-tier 304 stainless steel adjustable shelving; 2× upper front-mounted LED light strips

Subsystem / Metric	Specification Parameter	Value / Detail
Large Antechamber	Interface Ports & Power	7× DN 40 KF blind flange spare feedthrough ports; 1× internal 220V electrical power socket
	Dimensions	Cylindrical, Ø 360 mm × Length 600 mm
	Material & Finish	304 Stainless Steel; polished interior / white powder-coated exterior
	Doors & Mechanism	Dual vertical-lift doors, 10 mm thick anodized aluminum with balance lift mechanism
	Internal Tray	Sliding 304 stainless steel loading tray on guided rails
	Pressure Indication & Control	Analog dial vacuum gauge; automated touch-screen solenoid valve operation
Small Antechamber	Dimensions	Cylindrical, Ø 150 mm × Length 300 mm (100 mm chamber intrusion)
	Material & Finish	304 Stainless Steel; brushed interior / white powder-coated exterior
	Doors & Control	Dual quick-clamp opening doors; manual 3-way ball valve control with analog gauge
Gas Purification System	Column Capacity & Chemistry	Single 304 stainless steel column; 5 kg copper catalyst (60 L O ₂ capacity) & 5 kg molecular sieve (2 kg H ₂ O capacity)
	Recirculation Blower	DARGANG high-performance blower; flow rate capacity: 90 m ³ /h
	Compatible Working Gases	Nitrogen (N ₂), Argon (Ar), Helium (He)
	Automated Regeneration	PLC-controlled automated cycle using 5–10% Hydrogen (H ₂) balanced in inert gas
	Main & Control Valves	DN 40 KF electro-pneumatic angle valves; integrated modular solenoid valve manifold
Vacuum System	Vacuum Pump Type	Edwards 12 m ³ /h rotary vane pump with oil mist filter and automatic gas ballast control
	Ultimate Vacuum Level	≤ 2.0 × 10 ⁻¹ Pa
Analytical Sensors	Oxygen Analyzer (VTI)	Zirconia (ZrO ₂) sensor, Range: 0–1000 ppm, Resolution: 0.1 ppm (non-depleting, air-tolerant)
	Moisture Analyzer (VTI)	Phosphorus Pentoxide (P ₂ O ₅) sensor, Range: 0–500 ppm, Resolution: 0.1 ppm (field-cleanable & regenerable)
Solvent Trap System	Solvent Adsorber Unit	Ø 238 mm × Height 407 mm, 3 mm 304 SS, filled with 10 kg active adsorbent for HF and organic solvent capture
	Bypass & Isolation System	Manual bypass switching valves with vacuum evacuation port for contamination-free media replacement
Control & Instrumentation	PLC & Display	Siemens PLC architecture paired with Siemens Smart 700 7-inch color touchscreen interface
	Pressure Regulation	Setpoint range: ±10 mbar; Automatic system interlock trip protection at ±12 mbar
	Pressure Transducer & Gauges	Halstrup-Walcher pressure sensor; WIKA precision pressure gauges
	Foot Pedal Control	Dual-pedal switch for hands-free chamber pressure increase and reduction