

Single Station Laboratory Glovebox With Standalone Gas Purification Cabinet For Inert Atmosphere Research

Item Number: ST07



Introduction

This single station laboratory glovebox features a standalone gas purification cabinet maintaining sub-1 ppm moisture and oxygen levels. Engineered with automated PLC controls, premium components, and dual antechambers for demanding battery R&D and chemical synthesis.

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Application	Description	Key Benefit
Lithium-Ion Battery Assembly	Prototyping coin, pouch, and cylindrical cells with moisture-reactive electrolytes and lithium metal anodes.	Prevents violent electrolyte hydrolysis and surface passivation, ensuring reproducible electrochemical performance.
Solid-State Electrolyte Synthesis	Processing sensitive sulfide, halide, and oxide ceramic solid electrolyte powders under pure argon.	Eliminates hazardous H2S gas evolution and preserves ionic conductivity across reactive solid-state interfaces.
Organometallic & Catalysis Chemistry	Handling pyrophoric reagents, Grignard reagents, metal hydrides, and moisture-sensitive transition metal catalysts.	Guarantees worker safety while preserving catalytic activity and preventing premature reaction quenching.
Perovskite Optoelectronics	Spin-coating and thermal annealing of lead halide perovskite precursor films for photovoltaic cells.	Halts moisture-induced degradation during crystallization, directly improving device power conversion efficiency.
Inert Powder Metallurgy & 3D Printing	Post-processing, sieving, and packaging fine titanium, aluminum, and nickel superalloy powders.	Eliminates oxide film formation, ensuring optimal powder flowability, density, and sinterability in additive manufacturing.
Specialty OLED & Semiconductor Packaging	Encapsulating organic light-emitting diodes, quantum dots, and delicate microelectronic junctions.	Shields active organic layers from ambient moisture and oxygen ingress to prevent non-radiative dark spot formation.
Nuclear & Hazardous Isotope Handling	Containing radioactive or toxic samples under strictly regulated negative/positive pressure cascades.	Provides hermetic containment with certified HEPA/dust particulate filtration down to 0.3 microns.

Specification Category	Parameter	Specification Value (Item No. ST07)
Model Identification	Product Item Number	ST07
System Architecture	Glove Station Configuration	Single Station, 2 Glove Ports, Ergonomically Tilted Window
	Purification Unit Location	Standalone purification cabinet beneath main chamber
	Control Architecture	Siemens PLC with high-resolution color touchscreen interface
Atmospheric Purity	Target Moisture Level (H2O)	< 1 ppm (Standard Conditions: 20°C, 1 atm, 99.999% inert gas)
	Target Oxygen Level (O2)	< 1 ppm (Standard Conditions: 20°C, 1 atm, 99.999% inert gas)
Main Chamber Body	Chamber Construction Material	304 Stainless Steel, Acid-Resistant, 3 mm Wall Thickness
	Internal Dimensions (L x D x H)	1220 mm x 750 mm x 900 mm
	Internal Surface Treatment	Oil-film brushed stainless steel finish
	External Surface Treatment	High-durability powder-coated industrial finish (Signal White)
	Viewing Window Panel	Transparent Tempered Safety Glass, 8 mm Thickness, Angled

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	Glove Ports	High-strength Aluminum, O-ring sealed, self-lubricating seal
	Gloves Specification	Butyl Rubber, 8" Port Diameter, 32" Length, Thickness ≥ 0.4 mm
	Internal Dust Filtration	0.3 μm particulate filters on gas inlet and gas outlet ports
	Shelving Unit	Adjustable 2-tier 304 stainless steel interior shelving
	Internal Illumination	Integrated forward-mounted LED lighting above front window
Large Antechamber	Standard Feedthroughs	3 $\times$ DN 40 KF blind flanges, 1 $\times$ Internal 220V power socket
	Antechamber Dimensions	Diameter: 360 mm, Length: 600 mm (Right-side mounted)
	Material & Sliding Mechanism	304 Stainless Steel chamber with 304 Stainless Steel sliding tray
	Chamber Doors	Dual 10 mm thick anodized aluminum vertical lifting doors
Small Antechamber	Evacuation & Refill Control	Automated solenoid operation via touchscreen; analog pressure gauge
	Antechamber Dimensions	Diameter: 150 mm, Length: 300 mm (100 mm internal projection)
	Chamber Connection Type	Modular flanged connection (non-welded, expandable)
	Chamber Doors & Tray	Dual flip-latch doors, 304 stainless steel sliding tray
Gas Purification System	Evacuation & Refill Control	Automated solenoid operation via touchscreen; analog pressure gauge
	Purification Column Type	Single-column, 304 Stainless Steel containment vessel
	Purification Reactants	5 kg Copper Catalyst (Deoxygenation), 5 kg Molecular Sieve (Moisture)
	Purification Capacity	Deoxygenation: 60 L O ₂ capacity; Moisture removal: 2 kg H ₂ O capacity
	Working Inert Gases	High-purity Nitrogen (N ₂), Argon (Ar), or Helium (He)
	Circulation Blower	Variable frequency blower, max flow capacity 90 m ³ /h
	Catalyst Regeneration	Automated PLC cycle using 5-10% H ₂ in inert balance gas
Vacuum System	Integrated Valve Assembly	Custom 6-valve integrated 304 stainless steel manifold block
	Main Isolation Valves	DN 40 KF electro-pneumatic angle valves
	Rotary Vane Vacuum Pump	Dual-stage rotary vane pump, 12 m ³ /h displacement
	Ultimate Vacuum Rating	$\leq 2 \times 10^{-1}$ Pa (0.002 mbar)
Pressure Regulation	Pump Accessories	Oil mist exhaust filter and gas ballast control valve
	Working Chamber Setpoint	Programmable within +/- 10 mbar nominal working window
	Overpressure Protection	Automatic safety interlock triggered when exceeding +/- 12 mbar
Analytical Sensors	Auxiliary Pressure Control	Bi-directional foot pedal switch for hands-free box pressure tuning
	Moisture Analyzer	Range: 0-500 ppm; renewable/washable probe technology
	Oxygen Analyzer	Range: 0-1000 ppm; solid-state Zirconia (ZrO ₂) sensor cell
Solvent Trap Unit	Organic Solvent Adsorber	Internal canister ($\varnothing$ 136 mm $\times$ 256 mm H) loaded with 2 kg activated carbon