

Three Port Single Sided Glove Box Workstation With Inert Gas Purification System

Item Number: ST11



Introduction

This high-precision three-port single-sided glove box delivers an ultra-pure inert environment maintaining moisture and oxygen levels below 0.1 ppm. Featuring automated PLC touch control, continuous gas purification, and robust stainless construction, it ensures total protection for sensitive research.

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Application	Description	Key Benefit
Lithium-Ion & Solid-State Battery Assembly	Stacking, electrolyte filling, sealing, and testing of moisture-sensitive lithium metal anodes, sulfide-based solid electrolytes, and pouch cells.	Prevents hydrolytic degradation and dangerous passivation layer buildup by holding ambient moisture strictly below 0.1 ppm.
Organometallic & Coordination Chemistry	Synthesis, handling, and recrystallization of pyrophoric metal catalysts, Grignard reagents, and sensitive metal-organic frameworks (MOFs).	Eliminates oxidation risks and side reactions through continuous closed-loop inert gas scrubbing under argon or nitrogen.
Perovskite Solar Cell Fabrication	Spin coating, annealing, and vapor deposition prep of hybrid organic-inorganic halide perovskite precursors.	Safeguards volatile halide films from ambient humidity, significantly enhancing photovoltaic conversion efficiency and device repeatability.
Specialty Powder Metallurgy & 3D Printing	Sieving, packaging, and handling of fine titanium, aluminum, and refractory metal powders vulnerable to oxidation.	Prevents explosive surface reactions and oxide inclusions, preserving powder sphericity and metallurgical purity.
Organic Semiconductor & OLED Research	Deposition material prep, device encapsulation, and clean-environment testing of conjugated polymers and small molecules.	Protects reactive cathode interfaces and organic transport layers from trace oxygen quenching and moisture-induced dark spots.
Nuclear & Halogenated Chemical Processing	Handling reactive halide compounds with dedicated HF traps and activated alumina vapor capture systems.	Traps corrosive acid vapors before they degrade internal seals or catalyst beds, ensuring operator safety and unit longevity.

System Subassembly	Parameter / Specification	Value / Design Standard (ST11)
Main Chamber Body	Item Model Identifier	ST11
	Overall Internal Dimensions (L × D × H)	1500 mm × 750 mm × 900 mm
	Chamber Wall Material & Thickness	304 Stainless Steel, 3.0 mm thick
	Internal / External Surface Finish	Brushed Interior Finish / White Powder-Coated Exterior
	Sight Window	8 mm thick tempered safety glass, inclined ergonomic viewing angle
	Glove Ports	3 ports, solid aluminum alloy with double O-ring seals
	Gloves	8" diameter cuff, 32" length, heavy-duty butyl rubber
	Internal Shelving	3-tier integrated 304 stainless steel adjustable shelving
	Illumination	High-intensity external LED lighting mounted above view glass
	Chamber Feedthrough Interfaces	3 × DN40 KF blind flange feedthroughs, 1 × 220V electrical power feedthrough
Atmospheric Purity	Gas Filtration	Dual 0.3 μm HEPA particulate filters (1 × gas inlet, 1 × gas outlet)
	Water Vapor Content (H ₂ O)	< 0.1 ppm (under 20°C, 1 atm, 99.999% inert gas supply)

System Subassembly	Parameter / Specification	Value / Design Standard (ST11)
	Oxygen Content (O ₂)	< 0.1 ppm (under 20°C, 1 atm, 99.999% inert gas supply)
	Enclosure Leak Rate	< 0.001 vol%/h
Large Antechamber	Cylinder Dimensions	360 mm Diameter × 600 mm Length
	Material & Construction	304 Stainless Steel body, 10 mm anodized aluminum dual vertical-lift doors
	Sliding Tray	304 Stainless Steel with smooth guide tracks
	Vacuum & Refill Operation	Touchscreen-driven electro-pneumatic solenoid automation; analog pressure gauge
Heated Large Antechamber	Cylinder Dimensions	360 mm Diameter × 600 mm Length, 304 Stainless Steel
	Heating Architecture & Power	Wrap-around surface heating jacket, < 2000 W total power
	Temperature Range & Control	Ambient to 200°C; programmable digital PID controller with timer functions
Mini Antechamber	Cylinder Dimensions	150 mm Diameter × 300 mm Length (100 mm extending into main chamber)
	Material & Door Mechanism	304 Stainless Steel body, dual clamp-lock manual sealing doors
	Sliding Tray & Controls	304 Stainless Steel tray; manual 3-way ball valve; analog pressure gauge
Gas Purification System	Purification Column	Single-column closed-loop system, 304 Stainless Steel container
	Catalyst Fill & Chemistry	5 kg Copper Catalyst (Deoxygenation) + 5 kg Molecular Sieve (Moisture Adsorption)
	Total Absorption Capacity	60 L Oxygen (O ₂) / 2000 g Water Vapor (H ₂ O)
	Circulation Blower	90 m ³ /h integrated variable-frequency drive (VFD) blower
	Compatible Working Gases	High-purity Nitrogen (N ₂), Argon (Ar), or Helium (He)
	Column Regeneration Sequence	Fully automated PLC cycle using 5-10% H ₂ balance inert gas mix
	System Valve Architecture	DN40 KF electro-pneumatic angle main valve; 6-valve integrated SS manifold block
Vacuum System	Vacuum Pump Specification	Heavy-duty oil-sealed rotary vane pump, 12 m ³ /h displacement
	Ultimate Vacuum Rating	≤ 2 × 10 ⁻¹ Pa
	Accessories & Controls	Integrated oil mist exhaust filter, gas ballast control, automatic PLC on-demand startup
Sensors & Analyzers	Moisture Analyzer	P2O5 sensor probe, range 0-500 ppm, accuracy 0.1 ppm (regenerable/cleanable)
	Oxygen Analyzer	ZrO ₂ solid electrolyte sensor probe, range 0-1000 ppm, accuracy 0.1 ppm
Trap Accessories	Organic Solvent Trap	238 mm Dia. × 407 mm H, 304 SS, 10 kg activated carbon with bypass & purge ports
	Acid Vapor (HF) Trap	238 mm Dia. × 407 mm H, 304 SS, 10 kg activated alumina with bypass & purge ports
Control & Power	Control Architecture	Siemens PLC system with color touchscreen HMI and dual foot-pedal switches
	Dynamic Pressure Range	User-adjustable within ±10 mbar; automated alarm and shutoff at ±12 mbar
	Power Supply	220V AC / 50-60 Hz