

Three Glove Port Single Sided Operation Glovebox For Inert Gas Atmosphere Research

Item Number: ST10



Introduction

Engineered for demanding battery research, this three-glove single-sided glovebox maintains an ultra-pure inert atmosphere below 0.1 ppm moisture and oxygen. Features Siemens PLC automation, heated antechambers, integrated vacuum systems, and regenerative solvent purification.

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Application	Description	Key Benefit
Lithium Battery Assembly	Fabrication of coin, pouch, and cylindrical test cells involving metallic lithium, solid electrolytes, and hygroscopic liquid formulations.	Eliminates electrolyte decomposition and prevents surface passivation of high-reactivity lithium metal anodes.
Organometallic Synthesis	Handling, weighing, and catalyst preparation involving pyrophoric reagents, metal alkyls, and Grignard compounds.	Complete atmospheric oxygen elimination suppresses oxidation side reactions and ensures operator process safety.
Halide Perovskite Solar Cells	Spin-coating, thermal annealing, and encapsulation of high-efficiency perovskite thin films vulnerable to ambient moisture.	Prevents water-induced phase degradation, resulting in uniform crystal morphology and higher photovoltaic conversion efficiency.
Specialty Welding and Additive Manufacturing	Powder handling, laser micro-welding, and additive sintering of titanium, zirconium, and refractory alloy components.	Sub-ppm inert gas protection prevents interstitial oxygen embrittlement and maintains pristine weld pool integrity.
Semiconductor and OLED Encapsulation	Deposition, layer transferring, and hermetic barrier packaging of organic light-emitting polymers and nano-electronic devices.	Delivers a particle-controlled, ultra-dry environment, significantly extending operational life expectancy of sensitive organic layers.
Supercapacitor and Solid-State R&D	Synthesis of high-surface-area carbon electrodes, ionic liquids, and sulfide-based solid-state ceramic electrolytes.	Isolates sulfide precursors from moisture, blocking toxic hydrogen sulfide (H2S) off-gassing and preserving ionic conductivity.

System Category	Engineering Parameter	Technical Specification (ST10)
Model Reference	Equipment Identification	ST10
Core Performance	Moisture Concentration Limit	< 0.1 ppm (at standard 20°C, 1 atm, 99.999% inert supply)
	Oxygen Concentration Limit	< 0.1 ppm (at standard 20°C, 1 atm, 99.999% inert supply)
	Overall System Leak Rate	< 0.05 vol%/h
Main Enclosure	Internal Dimensions (L × D × H)	1500 mm × 750 mm × 900 mm
	Construction Material & Thickness	Heavy-gauge 304 Stainless Steel, 3 mm thickness
	Internal / External Finish	Brushed interior finish / Electrostatic white powder-coated exterior
	Viewing Window	8 mm thick sloped transparent tempered safety glass
	Glove Ports	3 ports, CNC-machined Aluminum Alloy, O-ring compression seal
	Gloves Specification	High-integrity Butyl Rubber, 8" port diameter, 32" length
	Internal Shelving & Lighting	3-tier adjustable 304 stainless steel shelving; upper front LED lighting
	Lifting & Handling Provisions	2 side-mounted structural handles (left plate), 4 top lifting eyebolts

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Large Antechamber	Utility & Feedthrough Ports	10 spare DN40KF feedthrough ports (4 left side, 6 rear wall); 1 electrical power feedthrough (220V)
	Internal Gas Filtration	0.3 μ m particulate HEPA filtration for supply and return ports
	Chamber Dimensions	Diameter: 360 mm, Length: 600 mm
	Construction & Mechanism	304 Stainless steel; sliding tray; 10 mm anodized aluminum dual doors with vertical hoist lift
Small Antechamber	Integrated Heating System	Internal heating tube with water-cooled flange; temperature $\leq 150^{\circ}\text{C}$; power $\leq 2000\text{W}$; PID intelligent control
	Operation & Pressure Readout	Automated touchscreen solenoid valve control and manual bypass; analog vacuum gauge display
	Chamber Dimensions	Diameter: 150 mm, Length: 300 mm (100 mm internal projection)
	Construction & Mechanism	304 Stainless steel with external insulation & protective shroud; threaded-lock dual doors; 304 SS tray
Gas Purification System	Operation & Pressure Readout	Manual quarter-turn vacuum valve control; analog pressure gauge display
	Purification Column Architecture	Single-column hermetic purification unit; 304 stainless steel vessel
	Active Purification Media	5 kg Copper Catalyst (Deoxygenation) + 5 kg Molecular Sieve (Moisture Adsorption)
	Total Purification Capacity	Deoxygenation: 60 L O ₂ ; Moisture Removal: 2 kg H ₂ O
Vacuum System	Circulation Blower & Working Gas	90 m ³ /h integrated blower with variable frequency drive (VFD); Nitrogen (N ₂) / Argon (Ar)
	Regeneration Cycle	PLC-automated sequence; Regeneration gas: N ₂ /Ar working gas blended with 5-10% H ₂
	Gas Valve Configuration	DN40KF electro-pneumatic main angle valves; 6-valve integrated stainless steel solenoid block
	Vacuum Pump Specification	12 m ³ /h rotary vane pump with integrated oil mist filter and gas ballast control
Process Control System	Ultimate Vacuum Level	$\leq 2 \times 10^{-1}$ Pa
	System Automation	Automated on-demand PLC start/stop and manual override modes
	Controller & Interface	Siemens PLC with high-resolution color touchscreen display
	Automatic Pressure Regulation	Programmable box working pressure within ± 15 mbar; automatic safety relief beyond ± 16 mbar
Analytical Sensors	Ergonomic Pressure Control	Integrated bi-directional foot pedal for real-time pressure increase/decrease adjustment
	Diagnostic & Safety Features	Self-diagnostics, power-loss auto-restart, automated gas purging, multi-level password protection
	Moisture Analyzer (H ₂ O)	Solid-state P2O ₅ sensor; 0-500 ppm range; 0.1 ppm resolution; fully regenerable and cleanable
	Oxygen Analyzer (O ₂)	Long-life ZrO ₂ zirconia sensor; 0-1000 ppm range; 0.1 ppm resolution; non-depleting in air
Solvent Management	Quick-Change VOC Trap	$\varnothing 238$ mm $\times$ 407 mm (H); 3 mm 304 stainless steel; loaded with high-efficiency activated carbon; pre-evacuation bypass