

Single Station Single Sided Glove Box Inert Gas Purification Workstation

Item Number: ST04



Introduction

Engineered for advanced battery and chemical research, this single station single sided glove box maintains an inert atmosphere with moisture and oxygen below 1 ppm, featuring automated Siemens PLC controls, dual transition antechambers, and integrated solvent purification systems.

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Application	Description	Key Benefit
Lithium & Sodium Battery Assembly	Assembly of coin cells, pouch cells, and split test cells involving metallic lithium, sodium foils, and reactive liquid electrolytes.	Prevents rapid oxidation and moisture degradation, ensuring accurate electrochemical impedance and cycling performance data.
Solid-State Electrolyte Research	Synthesis, cold pressing, and hermetic encapsulation of sulfide-, oxide-, and polymer-based solid electrolyte powders.	Eliminates hydrolysis reactions that generate toxic H ₂ S gas and compromise ionic conductivity.
Perovskite Solar Cell Fabrication	Spin-coating, thermal annealing, and encapsulation of organic-inorganic hybrid metal halide perovskite precursor films.	Protects moisture-sensitive perovskite crystallites during formation, boosting photovoltaic conversion efficiency and film uniformity.
Organometallic & Catalytic Synthesis	Manipulation, purification, and storage of pyrophoric reagents, Grignard reagents, and sensitive transition-metal catalysts.	Guarantees an inert nitrogen or argon environment, preventing spontaneous combustion and loss of catalytic activity.
Supercapacitor & Energy Storage R&D	Electrolyte filling, electrode wetting, and final sealing of ultra-capacitor cores with sensitive non-aqueous solvents.	Maintains low volatile organic background and strict dryness to achieve maximum working voltage and extended cycle life.
Specialized Metallurgy & Laser Sealing	Inert handling of fine reactive metal powders (titanium, zirconium) and micro-welding of hermetic electronic packages.	Minimizes gas entrapment, porosity, and oxide inclusions in finished welds and sintered components.

System Category	Parameter Specification	Value / Detail (ST04)
Model Identification	Product Item Number	ST04
Core Performance	Moisture Level (H ₂ O)	< 1 ppm (Standard condition: 20°C, 1 atm, 99.999% inert gas)
	Oxygen Level (O ₂)	< 1 ppm (Standard condition: 20°C, 1 atm, 99.999% inert gas)
	Overall Leak Rate	≤ 0.05 vol%/h
Main Enclosure	Internal Dimensions (L × D × H)	1220 mm × 750 mm × 900 mm
	Box Material	304 Stainless Steel, 3.0 mm thickness, acid-resistant
	Exterior / Interior Finish	White powder-coated exterior / Natural stainless steel interior
	Viewing Window	8 mm inclined tempered safety glass with protective film
	Glove Ports	Machined aluminum alloy, O-ring sealed, 2 ports
	Glove Specifications	Ansell Butyl Rubber, 0.4 mm thickness, 8" diameter, 32" length
	Internal Shelving	Multi-tier height-adjustable 304 stainless steel rack
	Internal Lighting	High-intensity glare-free LED strip mounted above front window
	Feedthrough Ports	3 × DN40 KF spare blind flanges (customizable); 1 × 220V power port (1.2 kW)

System Category	Parameter Specification	Value / Detail (ST04)
Large Antechamber	Dimensions	Diameter 360 mm, Length 600 mm (Right-side mounted)
	Material & Finish	304 Stainless Steel, polished interior / white painted exterior
	Door & Tray Mechanism	Dual 10 mm anodized aluminum vertical sliding doors; 304 SS sliding tray
	Control & Pressure Display	PLC touchscreen automated solenoid valve control; analog pressure gauge
Small Antechamber	Dimensions	Diameter 150 mm, Length 300 mm (100 mm extension into main chamber)
	Material & Finish	304 Stainless Steel, brushed interior / white painted exterior
	Door & Mechanism	Dual quick-clamp compression doors; integrated sliding tray
	Control & Pressure Display	Manual 3-way ball valve; analog pressure gauge
Gas Purification System	Purification Column	Single-column 304 stainless steel vessel
	Catalytic Filling	5 kg BASF Copper Catalyst (Deoxygenation) + 5 kg UOP Molecular Sieve (Desiccation)
	Purification Capacity	Oxygen removal: 60 L; Water absorption: 2.0 kg
	Compatible Working Gases	Nitrogen (N ₂), Argon (Ar), Helium (He)
	Blower Circulation Flow	Integrated Dargang blower, 90 m ³ /h flow capacity
	Particulate Filtration	Dual 0.3 µm HEPA filters (1 gas inlet, 1 gas outlet)
	Regeneration Process	Automated PLC programmed cycle using working gas with 5-10% H ₂ mixture
Vacuum System	Vacuum Pump Type	Edwards rotary vane pump with oil mist filter and gas ballast
	Displacement Speed	12 m ³ /h rated displacement (8 m ³ /h effective working throughput)
	Ultimate Vacuum Level	≤ 2.0 × 10 ⁻¹ Pa
Control & Instrumentation	Automation Hardware	Siemens PLC controller with color touch HMI screen
	Pressure Regulation Range	Operating pressure configurable within ±10 mbar; safety trip at ±12 mbar
	Hands-Free Control	Bidirectional pneumatic foot pedal for pressure increase/decrease
	Differential Pressure Sensor	Halstrup high-precision pressure sensor (Germany)
	Primary Dial Gauges	WIKA mechanical pressure gauges (Germany)
	Moisture Sensor (H ₂ O)	VTI P205 platinum electrode analyzer, range 0-500 ppm (cleanable/renewable)
	Oxygen Sensor (O ₂)	VTI Zirconia (ZrO ₂) solid electrolyte analyzer, range 0-1000 ppm
	Process Valves & Fittings	Burket electromagnetic solenoid valves; Legris pneumatic fittings
Auxiliary Traps	Solvent Adsorption Unit	Ø237 mm × 407 mm (304 SS), 9 kg activated carbon with manual isolation valves
	Hydrofluoric Acid (HF) Trap	Ø237 mm × 407 mm (304 SS), 9 kg activated alumina with manual isolation valves