Single Station Super Purification Vacuum Glove Box System For Ultra Pure Inert Atmosphere Research

Item Number: ST13

Introduction

Designed for advanced laboratory research, this single station super purification vacuum glove box delivers ultra-pure inert environments with moisture and oxygen levels below 1 ppm, automated regeneration, intelligent Siemens PLC control, and robust stainless steel construction for demanding materials processing.

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Application	Description	Key Benefit
Lithium & Solid-State Battery Assembly	Encapsulation, coin-cell fabrication, pouch-cell sealing, and electrolyte filling under ultra-low moisture conditions.	Prevents violent oxidation of metallic lithium and eliminates parasitic side reactions caused by trace water vapor.
Perovskite & Organic Photovoltaic R&D	Spin-coating, thermal annealing, and encapsulation of moisture-sensitive perovskite precursor films.	Protects delicate halide perovskite crystalline structures from rapid environmental degradation during device processing.
Organometallic & Air-Sensitive Synthesis	Handling of pyrophoric catalysts, Grignard reagents, metal alkyls, and moisture-labile coordination complexes.	Eliminates fire hazards, preserves reagent reactivity, and ensures repeatable chemical synthesis outcomes.
Advanced Powder Metallurgy & Additive Manufacturing	Sifting, loading, and recovery of reactive metal powders (titanium, aluminum, magnesium, zirconium alloys).	Inhibits surface oxidation, prevents interstitial gas contamination, and preserves mechanical integrity of sintered parts.
Semiconductor & Quantum Dot Processing	Surface passivation, nanomaterial synthesis, and microelectronic substrate packaging under inert gas blanket.	Guarantees high interfacial purity and minimizes non-radiative recombination centers caused by oxide impurities.
Specialty Welding & Laser Processing	Hermetic sealing and micro-laser welding of titanium, zirconium, or tantalum precision medical and aerospace assemblies.	Eliminates atmospheric embrittlement and discoloration in heat-affected zones by maintaining an inert argon environment.

Parameter Category	Specification Details	Configuration & Values (ST13)
Model Item Identifier	System Model Code	ST13
Target Contaminant Levels	Moisture Concentration (H2O)	< 1 ppm (Standard Operating Range)
	Oxygen Concentration (O2)	< 1 ppm (Standard Operating Range)
Main Chamber Dimensions	External / Internal Envelope	Length: 1220 mm × Depth: 750 mm × Height: 900 mm
Chamber Construction	Shell Material	304 Stainless Steel, 3.0 mm Thickness
	Internal Wall Finish	High-Grade Oil-Film Brushed Finish
	External Wall Finish	304 Stainless Steel Surface
Viewing Window	Window Geometry & Material	Slanted Front Panel, 8.0 mm Laminated Tempered Safety Glass
Glove Ports & Gloves	Port Ring Material & Sealing	High-Strength POM or Anodized Aluminum Alloy, Dual O-Ring Sealing
	Glove Material & Dimensions	Premium Butyl Rubber, Thickness: 0.4 mm, Diameter: 7" or 8"
Internal Shelving & Lighting	Storage Shelving	304 Stainless Steel, 2-Tier Modular Structure, Height Adjustable
	Chamber Illumination	Energy-Efficient Glare-Free LED Lighting, Protective Enclosure

Parameter Category	Specification Details	Configuration & Values (ST13)
Filtration & Utility Ports	HEPA Gas Filters	0.3 μm Particle Retention (One Gas Inlet, One Gas Outlet)
	Standard Feedthroughs	DN40KF Feedthrough Ports, Multiple Blind Spares, 1× 220V Internal Power Socket
Purification Unit Structure	Column Architecture	Single-Column Purification Circuit, Hermetically Sealed 304 Stainless Steel
	Purification Reactants	5 kg High-Activity Copper Catalyst + 5 kg Regenerable Molecular Sieve
	Total Absorption Capacity	Oxygen Removal: 60 L Pure O2; Moisture Absorption: 2.0 kg H2O
Gas Circulation System	Working Inert Gases	High-Purity Nitrogen (N2), Argon (Ar), or Helium (He)
	Internal Circulation Blower	Standard: 90 m^3/h Integrated Blower (Optional: 145 m^3/h or 180 m^3/h)
Regeneration System	Regeneration Operation	Fully Automated PLC Thermal Regeneration Protocol
	Required Regeneration Gas	Inert Carrier Gas + Hydrogen Blend (5% - 10% H2 balance N2/Ar)
Vacuum System	Rotary Vane Pump Rates	8 m^3/h or 12 m^3/h Standard (Optional: 16 m^3/h Heavy-Duty Configuration)
	Pump Features & Protection	Integrated Exhaust Oil Mist Filter, Manual Gas Ballast Control
Process Valves	Main Angle Valves	DN40KF Electro-Pneumatic Angle Valves
	Gas Control Valves	Integrated Solenoid Multi-Valve Block
Large Antechamber	Geometry & Dimensions	Cylindrical, Diameter: 360 mm × Length: 600 mm (Optional: Ø400 mm)
	Material & Surface	304 Stainless Steel (Interior: Oil-Film Brushed; Exterior: Paint or Mirror Finish)
	Doors & Mechanism	10 mm Anodized Aluminum Vertical-Lift Doors with Counterbalanced Hinge
	Material Tray & Gauges	Sliding 304 Stainless Steel Tray; Analog Vacuum/Pressure Gauge
	Cycle Control	Automated Evacuation and Refill Sequencing via PLC
Small Antechamber	Geometry & Dimensions	Cylindrical, Diameter: 150 mm × Length: 300 mm (Optional: Ø100 mm)
	Material & Surface	304 Stainless Steel (Interior: Oil-Film Brushed; Exterior: Paint or Mirror Finish)
	Operation & Gauges	Dual Hinged Doors, Analog Vacuum Gauge, Manual Control Valves
Automation & Control	Controller & Interface	Siemens Industrial PLC with Integrated Full-Color Touchscreen HMI
	Pressure Control Envelope	Freely Programmable within ±15 mbar; Automatic Safety Cut-Off at ±16 mbar
	Operational Safety Features	Auto-Diagnostics, Power-Off Memory, Auto-Recovery, Password Access Control
	Foot Switch	Bi-Directional Foot Pedal for Dynamic Box Pressure Adjustment
	Data Management	Automated Process Data Logging, Event Memory, and Export Capability
Analytical Sensors	Oxygen Transmitter	Solid-State / Electrochemical Sensor, Range: 0 to 1000 ppm
	Dew Point Transmitter	Precision Ceramic / Capacitive Sensor, Range: 0 to 500 ppm
Smart IoT System	Connectivity (Optional)	Mobile App / Web Portal Remote Monitoring, Push Alerts, Remote Diagnostics