

Solar Cell Single And Double Station Operation Glovebox With Purification And Laminar Flow System

Item Number: ST09



Introduction

Engineered for advanced solar cell fabrication, this combined single and double station operation glovebox provides ultra-pure inert processing with moisture and oxygen levels under 0.1 ppm, seamless T-chamber interconnectivity, Class 10 laminar air filtration, and automated PLC atmosphere control.

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Application	Description	Key Benefit
Perovskite & Organic Solar Cells	Synthesis of moisture- and oxygen-sensitive halide perovskite precursor solutions, substrate spin-coating, and cell packaging.	Prevents rapid degradation of organic-inorganic perovskite layers by holding H ₂ O and O ₂ below 0.1 ppm under ISO 4 dust-free laminar conditions.
Integrated Vacuum Thermal Evaporation	Seamless transfer of patterned substrates directly from the preparation station into an attached thermal coater via the recessed chamber port.	Eliminates air exposure during critical metal electrode (Ag/Al/Au) and charge-transport layer deposition steps.
Solid-State Battery Assembly	Handling of lithium metal anodes, sulfide-based solid electrolytes, and hermetic cell crimping.	Mitigates hydrolysis of reactive solid electrolyte powders and prevents toxic gas generation while maintaining low ambient moisture.
Organic Light Emitting Diodes (OLED)	Formulation of luminescent polymers, small-molecule ink preparation, and encapsulation processes.	Extends device operational lifespan by maintaining an ultra-clean environment free from particulate defects and trace atmospheric oxidizers.
Advanced Semiconductor & Thin Film R&D	Processing of 2D transition metal dichalcogenides (TMDs), quantum dots, and reactive organometallic compounds.	Provides vibration-damped thermal stabilization (15–36°C) and rapid material transfer across segregated workstations.
Air-Sensitive Chemical Synthesis	Handling, weighing, and storage of pyrophoric catalysts, metal alkyls, and moisture-curable resins.	Ensures operator safety and product integrity through automated chamber pressure control, quick-change solvent traps, and fail-safe interlocks.

System Category	Parameter	Specification (ST09)
Model Identifier	System Designation	ST09
Atmospheric Purity	Moisture (H ₂ O) Baseline	< 0.1 ppm (at 20°C, 1 atm, 99.999% inert gas supply)
	Oxygen (O ₂) Baseline	< 0.1 ppm (at 20°C, 1 atm, 99.999% inert gas supply)
	Overall Leakage Rate	≤ 0.001 vol%/h
Main Chamber Dimensions	Station 1 (Double-Station) Nominal Size	1800 mm (L) × 750 mm (D) × 900 mm (H)
	Station 2 (Single-Station) Nominal Size	1220 mm (L) × 750 mm (D) × 900 mm (H)
	Chamber Wall Material & Thickness	SUS304 Stainless Steel, 3.0 mm thickness
	Chamber Surface Finish	Interior: Brushed finish; Exterior: Spray-painted white
	Vacuum Coater Integration	Recessed left-side chamber geometry with dedicated evaporator mounting interface
Viewing Windows & Gloves	Front Window Construction	Flanged one-piece frame, O-ring vacuum seal, 8 mm tempered safety glass, inclined angle
	Glove Ports	High-integrity Aluminum Alloy with dual O-ring sealing grooves

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	Gloves Specification	Heavy-duty Butyl Rubber, Diameter: 8" (203 mm), Length: 32" (812 mm)
	Internal Workspace Storage	Integrated 3-tier adjustable SUS304 stainless steel shelving unit
	Illumination & Feedthroughs	Top-mounted LED lighting arrays; multiple blank DN 40 KF ports; 1× internal 220V power feed
Gas Purification System	Purification Column Configuration	Single-column purification unit, hermetically sealed SUS304 stainless steel casing
	Working Gas Compatibility	High-purity Nitrogen (N ₂) / Argon (Ar)
	Purification Material Load	5 kg Copper Catalyst (Deoxygenation) + 5 kg Molecular Sieve (Moisture Adsorption)
	Total Purification Capacity	Oxygen Removal: 60 L; Moisture Removal: 2000 g (2 kg)
	Circulation Blower Flow Rate	90 m ³ /h integrated blower with variable frequency drive (VFD)
	Column Regeneration Control	Fully automated PLC routine; Regeneration Gas: Working gas + 5–10% H ₂ mixture
	Solvent Vapor Purification	High-efficiency quick-change organic solvent vapor adsorption trap
Particulate & Cleanliness Control	Cleanroom Cleanliness Rating	Class 10 (US FED STD 209E) / ISO 4 (ISO 14644-1)
	Filtration Media Grade	HEPA H13 to ULPA U15 high-efficiency downflow filtration system
	Laminar Flow Velocity	Controlled between 0.2 m/s and 0.45 m/s via adjustable blower control
	Differential Pressure Monitoring	Analog differential pressure gauge across filter elements for timely replacement
Temperature Control System	Cooling Mechanism	Integrated ultra-clean heat exchanger with split floor-standing rotary compressor
	Temperature Setting Range	15°C to 36°C (Continuous closed-loop PID control)
	Temperature Display Accuracy	1°C
	Rated Cooling Capacity & Power	Cooling Capacity: 1050 W; Power Consumption: 640 W
Large T-Type Antechamber	Chamber Dimensions	Diameter: 360 mm, Length: 700 mm (SUS304 Stainless Steel)
	Door Configuration	3× Anodized Aluminum doors (10 mm thickness) with vertical mechanical lift mechanism
	Operation & Trays	Touchscreen-driven automated solenoid valves; sliding SUS304 stainless steel tray
	Functionality	Interlinks both chambers; supports left-to-right and center-to-side batch transfer
Small T-Type Antechamber	Chamber Dimensions	Diameter: 150 mm, Length: 300 mm (100 mm extension into glovebox)
	Door Configuration	3× SUS304 doors with quick-acting compression clamps
	Operation & Trays	Manual ball valves; fixed SUS304 stainless steel tray; analog vacuum gauge
	Functionality	Bi-directional inter-chamber transfer for small tools, crucibles, and substrate carriers
Standard Mini Antechamber	Chamber Dimensions	Diameter: 150 mm, Length: 300 mm (100 mm extension into glovebox)
	Door Configuration & Control	Dual blue clamp-lock doors; manual valve operation; analog vacuum gauge
Vacuum System & Valves	Rotary Vane Vacuum Pump	12 m ³ /h displacement, ultimate vacuum ≤ 2×10 ⁻¹ Pa, oil mist filter & gas ballast
	Angle Valves & Manifolds	DN 40 KF electro-pneumatic main angle valves; 6-valve integrated SUS solenoid manifold
PLC & Instrumentation	Controller & Interface	Siemens PLC with color touchscreen, password protection, and power-failure auto-restart
	Pressure Regulation	Operating setpoint freely adjustable within ±15 mbar; automatic safety trip at ±16 mbar
	Operator Foot Switch	Bi-directional foot pedal for hands-free chamber pressure adjustment
	Moisture Sensor Specification	Alumina ceramic thin-film probe; Range: 0–1000 ppm; Accuracy: 0.1 ppm
	Oxygen Sensor Specification	Electrochemical fuel cell probe; Range: 0–1000 ppm; Accuracy: 0.1 ppm