

## insert gas glove box with recirculating purification system

Insert gas glove box is a kind of experimental equipment used to provide oxygen-free, water-free or other specific atmosphere environment, is a set of automatic absorption of water, oxygen molecules, purification of the working environment of the closed loop working system.

### Insert Gas Glove Box Series

Insert Gas Gloveboxes are filled with inert gases through an advanced recirculation purification system and control system, capable of providing a high purity atmosphere that can meet specific cleaning applications with less than or equal to 1 ppm of oxygen and water in an inert environment. Insert gas glove box can maintain the purity of the internal atmosphere to ensure the accuracy and safety of the experiment, widely used in chemistry, materials science, biotechnology and other fields.

### Working Principle

1. The working gas in the box between the box and the purification column (water-oxygen adsorber), under the control and monitoring of PLC, through the pipeline and circulating fan for closed circulation.



2. When the working gas passes through the purification column, the water and oxygen are adsorbed, and then return to the box, with the cycle time, the water and oxygen content in the working gas in the box will be gradually reduced, and finally reach the target of less than or equal to 1ppm.
3. Purification column in a certain period of time after the cycle, will be adsorption saturation, can be regenerated, repeated use.

### **Purification System of Molecular Sieve Water Absorption Process**

1. **Gas circulation:** The gas in the box is pumped into the purification column.
2. **Adsorption stage:** The gas passes through the molecular sieve bed, water is selectively adsorbed, and the dry gas returns to the box.
3. **Regeneration stage after saturation:** The regeneration of molecular sieve is realized by heating and vacuuming, two purification columns, one column adsorption, the other column regeneration, continuous work can be realized.

### **Oxygen Absorption and Regeneration Process of Copper Catalyst**

1. **Oxygen absorption stage:** Copper metal reacts with oxygen to produce copper oxide.
2. **Regeneration stage:** When the copper catalyst is saturated, it can be heated or passed into the regeneration gas, speaking of copper oxide reduced to copper, the regeneration of the copper catalyst can be reused to absorb oxygen, forming a cycle.

### Insert Gas Glove Box Composition

- **Water analyzer:** Measuring range 0 to 1000ppm, model EA2-TX, through the cleaning and regeneration program to restore the initial state, to avoid the problem of pollution that is scrapped.
- **Oxygen analyzer:** Measuring range 0 to 1000ppm, model senztx-110. zro2 sensor is used to avoid the problem of short life of the fuel cell, which cannot be exposed to air.
- **Vacuum pump:** Pumping speed 12 cubic meters per hour, 14.4 cubic meters per hour, 16 cubic meters per hour.

### Insert Gas Glove Box Optional Equipment

- **Refrigerator:** Independent control system, integrated in the box side panel. Main body 304 stainless steel, optional temperature 0 to -30°C or 0 to -80°C.
- **Heating cabin:** Large transition cabin configuration heating system, temperature 0 to 200 °C, temperature control  $\pm 1$  °C.
- **Multi-functional configuration:** Built-in cold trap, heating plate or magnetic stirrer, etc.

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<b>One-sided model</b>	<b>GB12-2D</b>	<b>GB15-3D</b>	<b>GB18-4D</b>	<b>GB24-4D</b>
Two-sided model	GB12-4S	GB15-6S	GB18-8S	GB24-8S
One-sided model dimensions	1200x750x930mm	1500x750x930mm	1800x750x930mm	2400x750x930mm
Two-sided model dimensions	1200x1020x930mm	1500x1020x930mm	1800x1020x930mm	2400x1020x930mm
One-sided model Number of gloves	2	3	4	4
Two-sided model Number of gloves	4	6	8	8
Large transition bin	inner $\phi$ 385x602			
Small transition bin	inner $\phi$ 134x350			
Touchscreen	Siemens S7			
Purification column	single column	single column	single column	single column, double column

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<b>One-sided model</b>	<b>GB12-2D</b>	<b>GB15-3D</b>	<b>GB18-4D</b>	<b>GB24-4D</b>
Air blower	90, 150 cubic meter per hour			
Vacuum pump	14.4 cubic meter per hour			
Water parameter	less than 1ppm			
Oxygen parameter	less than 1ppm			

Purification system

Purification Column	Function: De-watering, de-oxygenation
	Container material: 304 stainless steel
	Purification materials: copper catalyst 5 kg, molecular sieve 5 kg

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One-sided model	GB12-2D	GB15-3D	GB18-4D	GB24-4D
	Purification capacity: 60L oxygen removal, 2kg water removal			
circulatory system	Water and oxygen parameters: less than 1 ppm			
	Working gas: Nitrogen, Argon, Helium			
	Circulation capacity: circulation fan flow 90 cubic meters per hour, 150 cubic meters per hour			
Regeneration	Operation: PLC automatically controls the regeneration process			
	Regeneration gas: a mixture of working gas and hydrogen, of which 5% to 10% is hydrogen			

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Vacuum pump	12, 14.4, 16 cubic meter per hour			
Valves	Main valve: DNKF, electropneumatic angle valve. Control valve: solenoid integrated valve			
Organic solvent adsorber	The circulating gas can first pass through the adsorber to adsorb volatile organic solvents and atmosphere without destroying the high purity atmosphere.			

Boxes and transition bin

Box	304 stainless steel, acid-resistant, thickness 3mm
Material transition bin	304 stainless steel, vacuum environment, $\phi$ 385x602, built-in sliding tray
Tools transition bin	304 stainless steel, vacuum environment, $\phi$ 134x350
Viewing window	Tempered glass 12 mm thick

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Lighting system	Explosion-proof LED lighting system on top of the viewing window			
Shelf	Stainless steel, height adjustable			
Touchscreen	Siemens S7 as standard, also available with Kunlun Tongtai brand			
Gloves	American honeywell butyl rubber gloves, also optional ansell latex gloves			
Power connector	The box is equipped with a power connector, 220Vac, 50Hz			
Valves	Main valve: DNKF, electropneumatic angle valve. Control valve: solenoid integrated valve			
Filter	1 each outlet and inlet filter, filtration accuracy less than 0.3 micron			
Foot switch	Foot-operated adjustment of control pressure			
Bracket casters	Stable load bearing, flexible movement			