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# WINTERS INSTRUMENTS





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# Specialty Gas Supply System

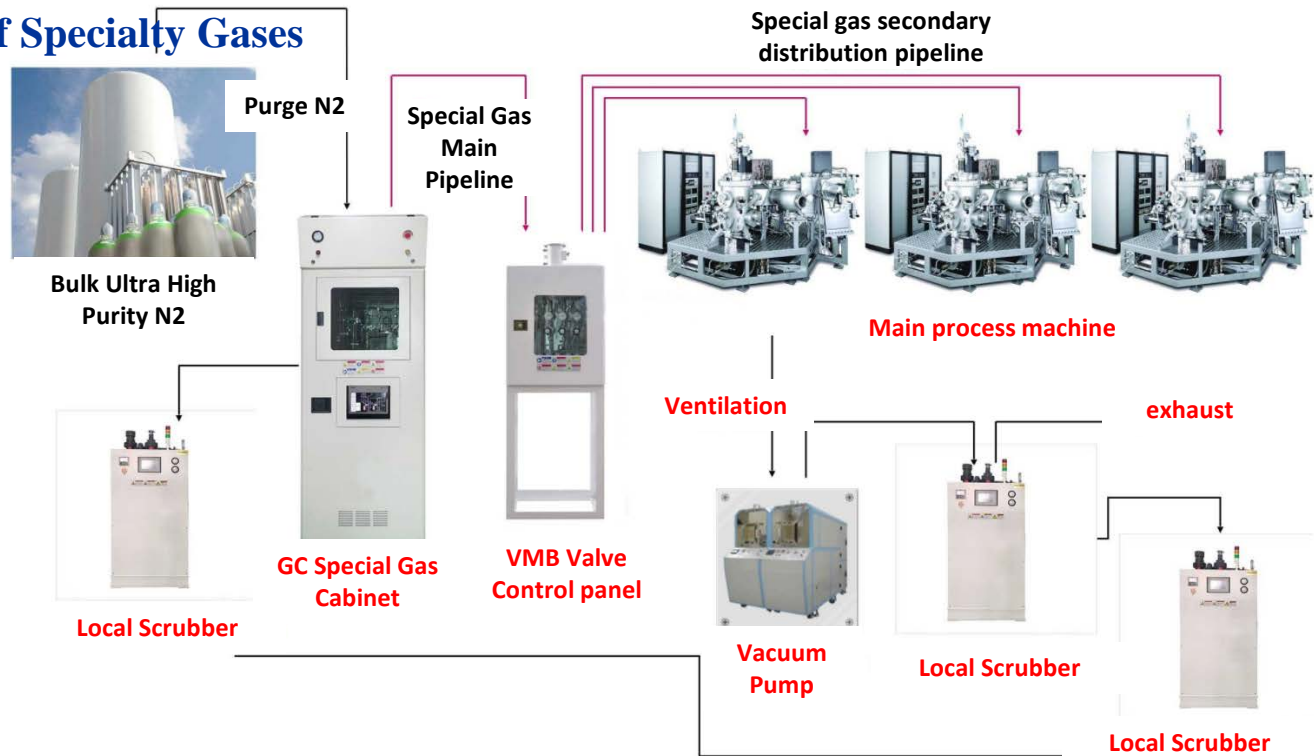
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The special gas supply system mainly includes 3 parts:

**Special gas cabinet** — the source of gas supply, supplying gas at a stable pressure

**VMB/VMP** — gas distributor, equipped with valves to control each gas line

**Process Equipment - End of Specialty Gases**





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# Specialty Gas Supply System

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## Specialty Gas Supply Process:

For toxic, flammable and explosive gases, use: gas cabinet (GC) + valve control panel (VMB)

For inert gas, use: gas rack (GR) + valve plate (VMP)

**Most gas cylinders have high pressure, and semiconductors have extremely high requirements for the stability of the gas source supply. In order to ensure the stability of the gas source, a two-stage pressure regulation method is adopted:**

Gas cabinet or gas plate for primary pressure regulation, valve control panel or valve plate for secondary pressure regulation

## Gas cabinet + valve control panel VS gas rack + valve plate

The former has a closed box, the negative pressure in the gas cabinet is not less than 100Pa, and it has an exhaust port. With automatic switching and purging function.

These are not available in the latter.



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# Gas Cabinet

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Gas Cabinet

Each gas cabinet will be equipped

with 5-6 pressure sensors:

-30"Hg-0-200 psi (or 250psi) 2 pcs

-30"Hg-0-500 psi 1-2 pcs

-30"Hg-0-3000 psi 2 pcs



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# Gas Cabinet & Gas Frame

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# Valve Control Panel VMB

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# Specialty Gas Exhaust Process

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After the pipeline system is filled with high-purity nitrogen or argon to a certain pressure, the vacuum operation is performed, and then high-purity nitrogen or argon is filled. This process needs to be repeated more than 30 times, and then the system is maintained at a certain negative pressure that is "Vacuum state". It is equivalent to repeated impact from negative pressure to full scale.

Therefore, the impact tolerance requirements for pressure gauges and pressure sensors are very high. All brands on the market currently have zero point drift, so they will be equipped with zero adjustment devices included WINTERS pressure transmitter.



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# Explanation of professional terms

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## **AP Pipe: annealed and pickled pipe**

Passivated seamless stainless steel pipes that have been pickled or passivated to remove residual particles on the surface.

## **BA Pipe: bright annealing pipe**

Bright seamless stainless steel tubes that have undergone hydrogenation or high-temperature heat treatment in a vacuum state to eliminate internal stress and form a passivation film on the surface of the tube.

## **EP Pipe: electro-polished pipe**

After electrochemical polishing, the actual area of the surface layer is reduced to the greatest extent, and a thicker closed chromium oxide film is formed on the surface of the electrochemically polished seamless stainless steel tube.

## **Purge**

The process of replacing other gases in a specialty gas system with nitrogen and argon.

## **Vent**

Essential gas exhausted from specialty gas equipment and systems.



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# Explanation of professional terms

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## According to SMEI F19 standard

GP (general purpose grade) Surface roughness:  $Ra(max): 0.62\mu m$ ,  $Ra(avg): 0.5\mu m$

HP (high purity grade) Surface roughness:  $Ra(max): 0.38\mu m$ ,  $Ra(avg): 0.25\mu m$

UHP (Ultra-high purity grade) Surface roughness:  $Ra(max): 0.25\mu m$ ,  $Ra(avg): 0.13\mu m$





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# VCR Connection

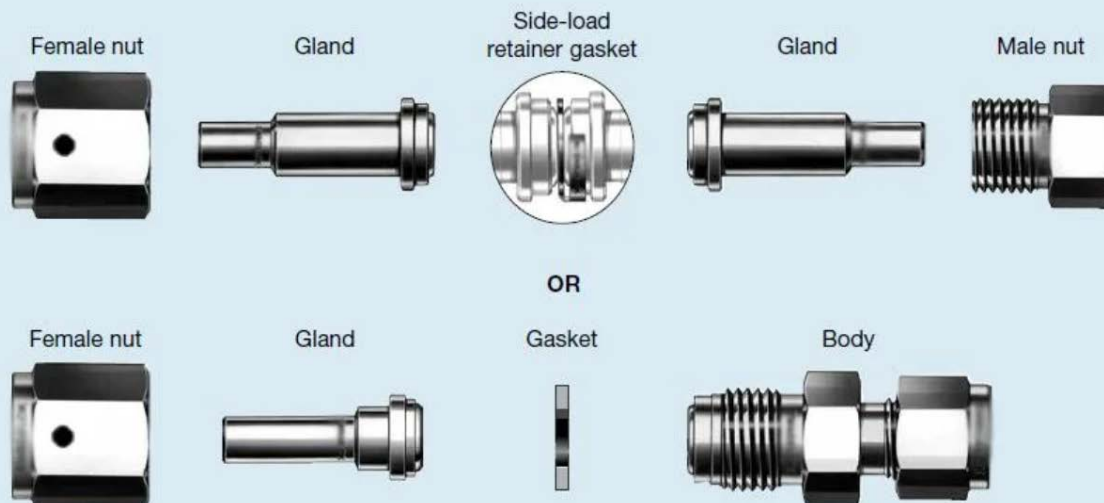
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## VCR Connection

The full name of VCR is Vacuum coupling Radius Seal (vacuum connection radial seal), which is the registered trademark of the metal surface hard sealing joint of Swagelok (Swagelok) company in the United States. VCR connectors were first used in the aerospace industry, and are currently widely used in the semiconductor optoelectronic manufacturing industry.

The sealing element of the VCR joint adopts a metal gasket, which compresses the metal gasket through the interlocking of the inner and outer threads, causing the gasket to deform to a certain extent, so as to achieve the effect of hard sealing.

### Typical VCR Assemblies

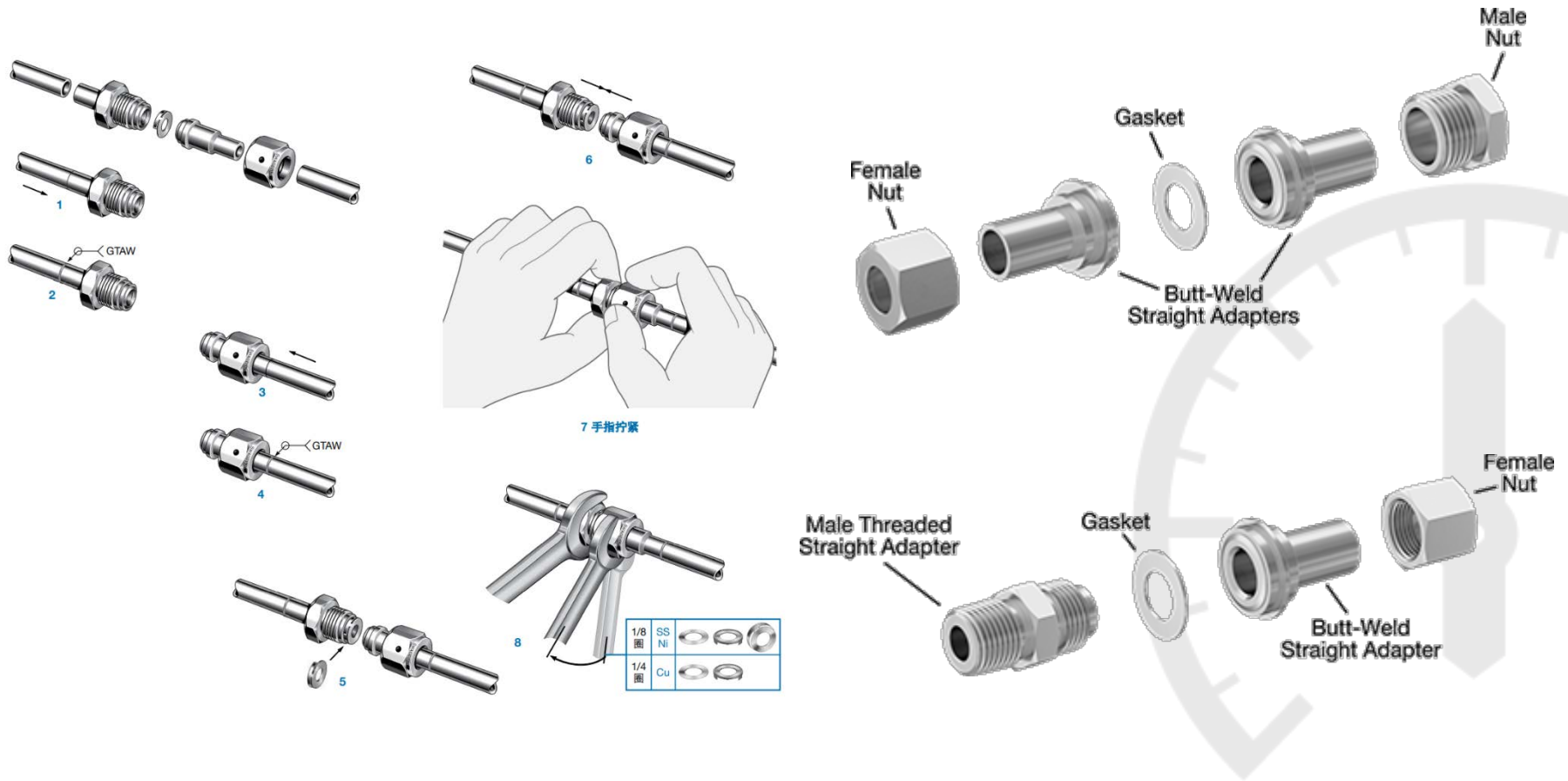




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# VCR Connection

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# Classification of Clean Room

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## USA Standard FS209E

Cleanliness level	Maximum allowable quantity (grains/m <sup>3</sup> )				
	0.1µm	0.2µm	0.3µm	0.5µm	5µm
1	35	7.5	3	1	N/A
10	350	75	30	10	N/A
100	N/A	750	300	100	N/A
1000	N/A	N/A	N/A	1000	7
10000	N/A	N/A	N/A	10000	70.3
100000	N/A	N/A	N/A	100000	700



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# Classification of Clean Room

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## China Standard GB50073(ISO14644-1)

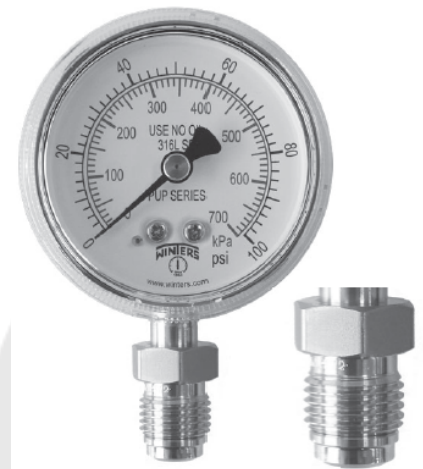
Cleanliness level	Maximum allowable quantity (grains/m3)					
	0.1μm	0.2μm	0.3μm	0.5μm	1μm	5μm
1	10	2				
2	100	24	10	4		
3	1000	237	102	35	8	
4	10000	2370	1020	352	83	
5	100000	23700	10200	3520	832	29
6	1000000	237000	102000	35200	8320	293
7				352000	83200	2930
8				3520000	832000	29300
9				35200000	8320000	293000



# Ultra High Purity Pressure Gauge PUP Series

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- All wetted parts are electro-polished accord to SEMI F19,  $Ra \leq 0.25\mu m$
- 100% Helium leak tested and packed in class 100 clean room
- Class A accuracy per ASME B40.1
- VCR® compatible pressure connection threads, include male and female



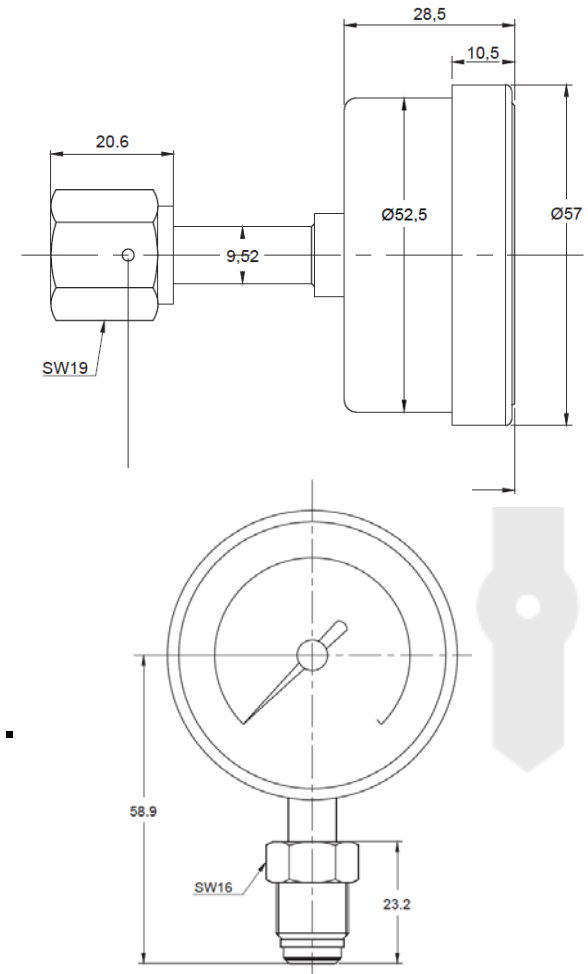


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# Ultra High Purity Pressure Gauge PUP Series

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- Dial size: 1.5" & 2"
- Accuracy: 1.5" Class B; 2" Class A
- Range: Vacuum up to 6000 psi
- Process connection: 9/16"18UNF (1/4"VCR) male or female
- Mounting direction: bottom or back
- Optional feature with switching contact (SPST) max. 30VDC, 0.5A.





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# Ultra High Purity Pressure Transducer LUP Series

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- All wetted parts are electro-polished accord to SEMI F19,  $Ra \leq 0.13\mu m$
- 100% Helium leak tested and packed in class 100 clean room
- Accuracy up to 0.1%BFSL(include linearity, hysteresis and repeatability)
- Various type of VCR connection available: male, female, fixed and swivel



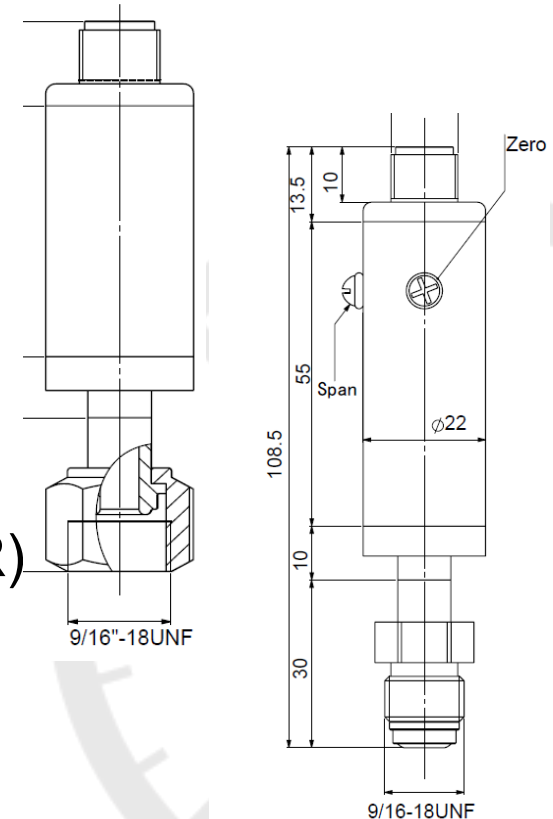


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# Ultra High Purity Pressure Transducer LUP Series

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- Range: Vacuum up to 5000 psi
- Accuracy: 0.15%BFSL @25°C (Standard)
- Long term stability: max 0.25%FS/year
- Output: 4-20mA, 2-wire
- Power supply: 10 to 30 VDC
- Ingress protection IP67
- Electrical connection M12\*1 (4 pins)
- Process connection: 9/16"-18UNF (1/4"VCR)  
female, male, fixed,  
swivel
- Explosion proof Ex na IIC T4/T5/T6 Gc





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# Ultra High Purity Customers & Projects References list

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- Zhejiang Jinray Electronics Technology Co. Ltd - Bulk Gases package
- Silan Microelectronics Co., Ltd.- Bulk Gases package
- 湖北玖恩智能科 (EGP Ever Grace) - Bulk Gases package
- BYD (EV) - Bulk Gas package
- Huawei FAB Guangzhou - Bulk Gas package
- Shanghai H.K Construction Engineering Co.,Ltd - Bulk Gases Package
- JA Solar – Bulk Gases package
- JiangSu XingYi Technology Co.Ltd – Bulk Gas package



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# Ultra High Purity Customers & Projects References list

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- Wuhan Hongxin Semiconductor, HSMC - Gas Cabinets and Bulk Gases
- Advanced Micro-Fabrication Equipment Inc. China - Special gas cabinet
- Gasbo Semiconductor - Special gas cabinet
- MTL Technologies (Shanghai) Co.,LTD - Special gas cabinet
- PNC Process Systems Co - Special gas cabinet
- HUNGO SEMICONDUCTOR EQUIPMENT(SHANGHAI)CO.,LTD. –  
Special gas cabinet
- Shanghai GTA Semiconductor Co., Ltd. - Gas cabinets and bulk gas pipeline



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# Ultra High Purity Customers & Projects References list

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- Air Liquide - Gas station
- Linde Gas Semiconductor Co. Ltd – Gas Station
- Fuxin Microelectronics Co., Ltd. – Gas Station
- Shanghai Mechanical & Electrical Industry Co. Ltd – Gas Station
- Dalian Huabang Chemical Co. Ltd – Gas Purifier
- Inner Mongolia Photonics Technologies Co.,Ltd - Special gas pipeline
- SimPure Technology - Purified Gas (OEM)



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# Thank you

