



NANJING OCEAN INDUSTRY CO., LTD
NANJING OCEAN GROUP CO., LIMITED

ASU & PSA & CO₂ RECOVERY PLANT

--THE PROFESSIONAL SUPPLIER OF GAS PLANT SOLUTION



CATALOG 2025

SMALL GAS TYPE ASU CRYOGENIC PLANT

Internal Compression Air Separation Plants:

The process involves removing the oxygen compressor, extracting the liquid oxygen from rectifying column main condenser. High pressure air and liquid oxygen exchange heat through the liquid oxygen pump pressure, then the liquid oxygen is vaporized in the cold box to produce gas as one of the output products.

Process: Compressed Air- Precooling- Purification- Rectification Heat Exchanger(low pressure liquid)- Liquid Oxygen Pump(pressurized liquid oxygen)- Oxygen Carburetor- Oxygen Bottles

Main Application:

- 1 Metallurgical and Chemical Equipment:
Requires a large amount of gas for operating gas sales business simultaneously.
- 2 Chemical (Petrochemical) Industry.



THE MAIN TECHNICAL SPECIFICATIONS OF SMALL TYPE SERIES ASU

Model	O ₂ Output (Nm ³ /h)	O ₂ Purity (%)	O ₂ Pressure (bar.A)	N ₂ Output (Nm ³ /h)	N ₂ Purity (PPmO ₂)	N ₂ Pressure (bar.A)	Power Consumption (KWh/Nm ³)	Fractionation Column Size(mm)
HG-ZO-40	40	≥99.6	150	-	-	-	≤1.4	1500*1500*6000
HG-ZO/N-40/40	40	≥99.6	150	40	≤10	150	≤1.4	1500*1500*7000
HG-ZO-50	50	≥99.6	150	-	-	-	≤1.4	1500*1500*6000
HG-ZO/N-50/50	50	≥99.6	150	50	≤10	150	≤1.4	1500*1500*7500
HG-ZO-80	80	≥99.6	150	-	-	-	≤1.38	1500*1500*7000
HG-ZO/N-80/80	80	≥99.6		80	≤10		≤1.38	2200*2000*8000
HG-ZO-100	100	≥99.6		-	-	-	≤1.38	2200*2000*7000
HG-ZO/N-100/100	100	≥99.6		100	≤10	-	≤1.38	2200*2000*8000
HG-ZO-160	160	≥99.6		-	-	-	≤1.38	2200*2000*8000
HG-ZO-180	180	≥99.6		-	-	-	≤1.38	2000*2200*9000

MIDDLE TYPE ASU CRYOGENIC PLANT

External Compression Air Separation Plants: The process involves the rectification column, directly producing low-pressure oxygen, which is then re-heated through the main heat exchanger. Afterwards, the oxygen is pressurized by the oxygen compressor, which is providing both O₂ & N₂ to customers, also called conventional air separation.

Process: Compressed Air -Precooling- Purification- Rectification Heat Exchanger (Low Pressure Gas)- Oxygen Storage- Oxygen Compressor (Pressurized Oxygen)- Oxygen Bottles.

Main Application:

1 Metallurgical Air Separation Equipment: raw material air compressor and gas booster can be combined into a single machine, making it suitable for production expansion in constrained environments for customers.

2 Coal Chemical Industry: high pressure requirements for equipment.



THE MAIN TECHNICAL SPECIFICATIONS OF MIDDLE TYPE SERIES ASU

MODEL CONTENTS		HG-DON-180/400	HG-DON-350/700	HG-DON-550/1200	HG-DON-750/1200	HG-DON-1000/2000	HG-DON-2000/4000	HG-DON-3000/3000
GOX FLOW	NM ³ /H	180	350	550	750	1000	2000	3000
GOX PURITY	% (O ₂)	99.6	99.6	99.6	99.6	99.6	99.6	99.6
GAN FLOW	NM ³ /H	400	700	1000	1500	2000	4000	3000
GAN PURITY	PPM (O ₂)	≤10	≤10	≤10	≤10	≤10	≤10	≤10
OPERATING PRESSURE	MPA	0.63	0.63	0.6	0.6	0.58	0.58	0.56
START TIME	H	≤24	≤24	≤20	≤20	≤18	≤18	≤36
OPERATING PERIOD	YEAR	≥1	≥1	≥1	≥1	≥2	≥2	≥2

LIQUID TYPE ASU CRYOGENIC PLANT

Applying advanced techniques for low-temperature rectification to separate the components of atmospheric air, developing and designing low-pressure molecular sieves for air purification, and utilizing the turbo-expander refrigeration process to further reduce power consumption in small and medium-sized air separation plants.

External Compression: The external compression process consists of a rectifying tower that directly produces low-pressure oxygen. The oxygen then passes through the main heat exchanger to recover heat from the cold box, and is subsequently pressurized by an oxygen compressor to the desired pressure for the user. This process is also known as conventional air separation.

Process Flow:

Air-- Compression-- Pre cooling-- Purification-- Distillation of Heat Exchanger (low pressure gaseous)-- O
Oxygen Bag-- Oxygen Compressor (pressurized oxygen)-- Oxygen Bottle

Internal Compression: The internal compression process eliminates the need for an oxygen compressor by directly using a liquid oxygen pump and an air compressor instead. Liquid oxygen is extracted from the main condenser-evaporator of the ASU rectification tower, pressurized to the desired pressure by the liquid oxygen pump, and then vaporized through a high-pressure air and liquid heat exchanger. The resulting gas is delivered from the cold box as the final product.

Process Flow:

Air-- Compression-- Pre cooling-- Purification-- Distillation of Heat Exchanger (low pressure gaseous)--Liquid oxygen (LOX turbo pump)-- Oxygen Vaporizer-- Oxygen Bottle

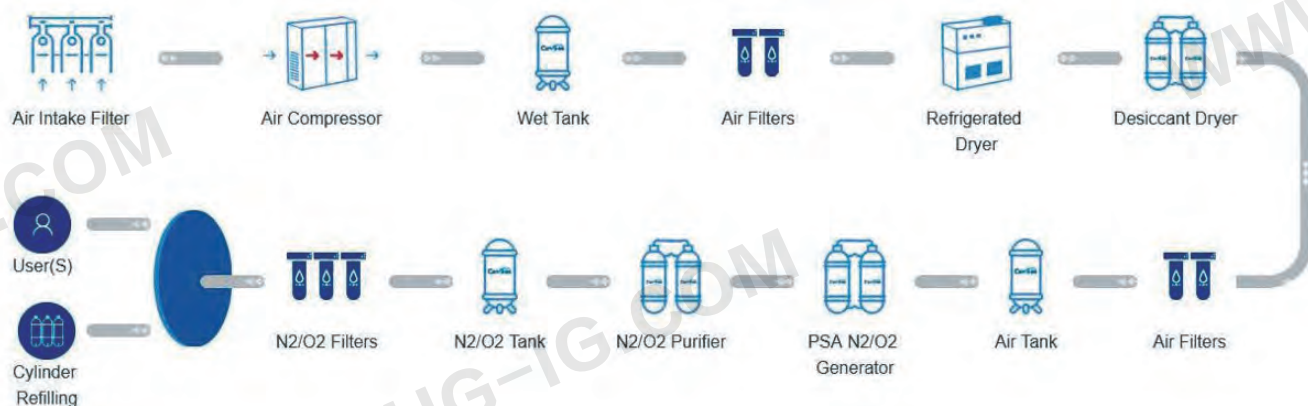


THE MAIN TECHNICAL SPECIFICATIONS OF LIQUID TYPE SERIES ASU

MODEL CONTENTS		HG-DON-430Y	HG-DON-880Y	HG-DON-1350Y	HG-DON-1750Y	HG-DON-2500Y
LO ₂ FLOW	KG/H	430	880	1350	1750	2500
	TPD	10.0	21.0	32.4	42.0	60.0
LO ₂ PURITY	%(O ₂)	99.6	99.6	99.6	99.6	99.6
LOX PRESSURE	BAR	2.0	2.0	2.0	2.0	2.0
OR PRODUCING OF LN ₂						
LN ₂ FLOW	KG/H	430	880	1350	1750	2500
	TPD	10.0	21.0	32.4	42.0	60.0
LN ₂ PURITY	PPM(O ₂)	≤10	≤10	≤10	≤10	≤10
LN ₂ PRESSURE	BAR	7.0	7.0	7.0	7.0	7.0
START-UP TIME	HOUR	≤8	≤8	≤8	≤8	≤8
OPERATING PERIOD	YEAR	≥2	≥2	≥2	≥2	≥2

PRESSURE SWING ADSORPTION SERIES

PSA N2/O2 TYPICAL WORKFLOW



1. Air compressor (screw type), air is used as raw material to collect & compress air to 8 bar.
2. Refrigerated dryer, the standard configuration removes moisture and impurities in the air, so that the air dew point reaches -20°C (the intermediate configuration uses an adsorption dryer, and the dew point reaches -40°C ; the advanced configuration uses a combined dryer, and the dew point reaches -60°C).
3. Precision Filter, A / T / C three-stage filter to remove oil, dust and impurities.
4. Air buffer tank, store pure and dry air for subsequent adsorption and separation of oxygen and nitrogen as raw material storage.
5. Adsorption tower, A&B adsorption tower can work alternately, regenerating adsorption, filling sodium molecular sieve to filter out oxygen molecules.
6. Oxygen & nitrogen analyzer, real-time monitoring and analysis of oxygen & nitrogen purity, indicating that the equipment is working normally and alarming.
7. Valves & pipelines, intelligent control valves realize automatic operation of equipment, PLC control, SUS304 pipelines.
8. Oxygen & Nitrogen Buffer Tank, store oxygen & nitrogen with qualified purity, which can be directly piped or used for bottle filling.
9. Pressure regulator, adjust and temperature the outlet pressure of oxygen & nitrogen (3-6 Bar).
10. Dust filter, remove the dust brought by molecular sieve in oxygen & nitrogen.
11. Check valve, prevent oxygen & nitrogen back flow.
12. Booster, gas booster, pressurize the oxygen & nitrogen to the filling pressure, generally 150 bar or 200 bar.
13. Pressure regulating valve, gas compressor pressure regulation.
14. Filling manifold, split high-pressure oxygen & nitrogen into each gas cylinder.

TECHNICAL FEATURES

- Pressure Swing Adsorption Technology as the process principle, mature and reliable.
- Intelligent soft cycle switching, purity and flow can be adjusted within a certain range.
- All relevant system components are reasonably configured and the failure rate is low.
- Reasonable internal components, uniform airflow distribution, reduce the impact of high-speed airflow.
- Perfect process design, optimal use effect.
- Unique molecular sieve protection measures extend the service life of Zeolite molecular sieve(carbon molecular sieve).
- The intelligent interlocking unqualified oxygen (nitrogen) emptying device guarantees the oxygen (nitrogen) quality of the product.
- Optional oxygen (nitrogen) device flow, automatic purity adjustment system, remote control system, etc.
- The whole machine leaves the factory, and there is no basic device indoors.
- Convenient installation of matching pipes.
- The operation is simple and stable, and full automation, which can realize unmanned operation.

PSA OXYGEN PLANT

WORKING PRINCIPLE



Following the principle of pressure swing adsorption, zeolite molecular sieve is used as the adsorbent. Due to the selective adsorption characteristics of zeolite molecular sieve, nitrogen is adsorbed by molecular sieve in a large amount, oxygen is enriched in the gas phase, and nitrogen and oxygen separation is realized under the action of pressure swing adsorption. Adopting double or multi-tower structure, while adsorbing oxygen, desorbing and regenerating at the same time, the opening and closing of pneumatic valves are controlled through intelligent programs such as PLC, so that two or more towers are cycled alternately to continuously produce high-quality oxygen.

TECHNICAL INDICATORS

Oxygen Production	3 ~ 200Nm ³ /h	Oxygen Purity	93-96%
Oxygen Pressure	3.0-10.0bar	Dew Point	≤ -40°C (Normal Pressure)
Application Field	Medical, Industrial combustion, Sewage treatment, Aquaculture, etc.		
Main Components	Air Compressor, Air Purification System, Air Buffer Tank, Oxygen Buffer Tank, Adsorption Tower, PLC Control Cabinet, Oxygen Analyzer, Booster, Filling Manifold, Valve& Pipeline, Etc.		

PSA NITROGEN PLANT



WORKING PRINCIPLE

Following the principle of pressure swing adsorption, high-quality carbon molecular sieve is used as the adsorbent. Under certain pressure, due to the dynamic effect, the diffusion rate of oxygen and nitrogen on the carbon molecular sieve is different. The oxygen molecules are adsorbed by the carbon molecular sieve in large quantities. Nitrogen molecules are enriched in the gas phase to achieve oxygen and nitrogen separation.

Since the adsorption capacity of carbon molecular sieve for oxygen varies significantly with pressure, reducing the pressure can adsorb the oxygen molecules adsorbed by the carbon molecular sieve, so that the carbon molecular sieve can be regenerated and reused.

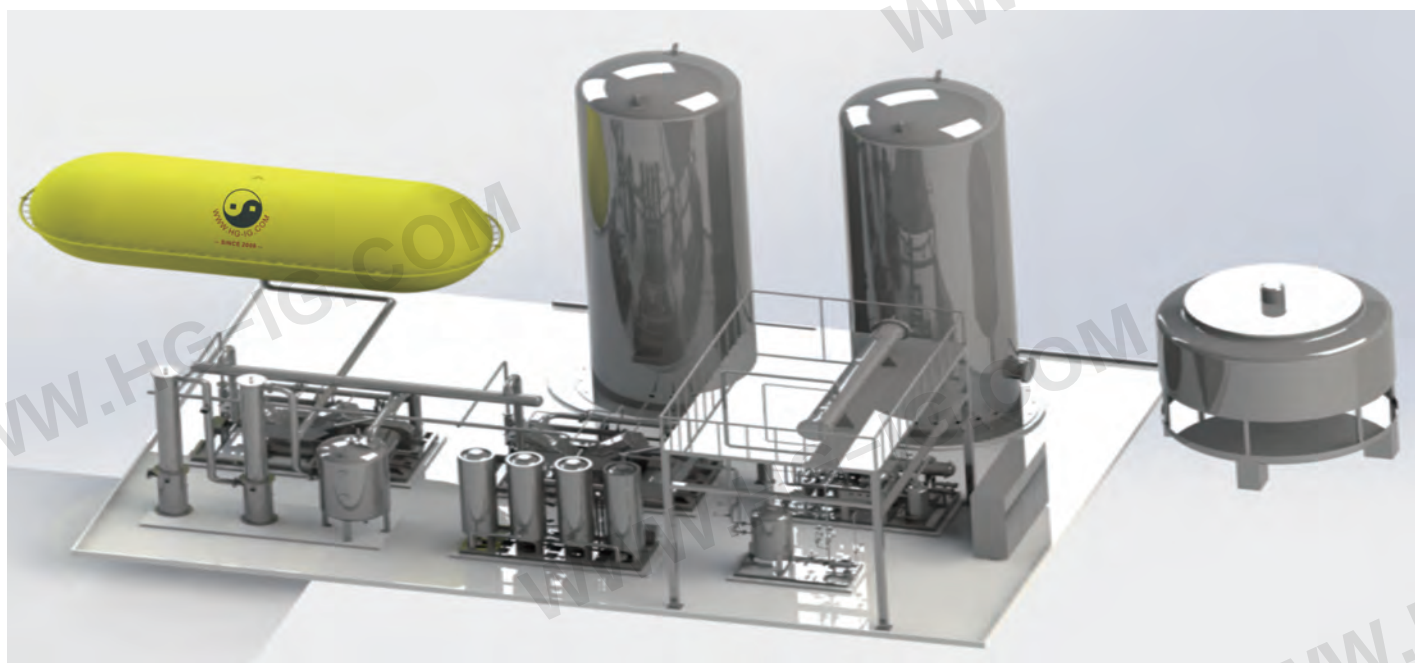
Two adsorption tower processes are adopted, one is for adsorption and nitrogen production, and the other is for desorption and regeneration, alternating cycles and continuous production of high-quality nitrogen.

TECHNICAL INDICATORS

Nitrogen Production	3 ~ 2,000Nm ³ /h .	Nitrogen Purity	95%-99.999%
Nitrogen Pressure	3.0-10.0bar	Dew Point	≤ -40°C(Normal Pressure)
Application Field	Industrial Use, Food Protection, Medical Treatment, Material Processing, Scientific Research And Education, Biology, Etc.		
Main Components	Air Compressor, Air Purification System, Air Buffer Tank, Oxygen Buffer Tank, Adsorption Tower, PLC Control Cabinet, Oxygen Analyzer, Booster, Filling Manifold, Valve & Pipeline, Etc.		

CO₂ RECOVERY PLANT

With the improvement of people's living standards and the enhancement of environmental protection awareness, the demand for CO₂ is more and more strong. Meanwhile, each country and enterprises pay more and more attention to food safety, and users have more and more strict requirements on the quality of CO₂ products. Generally, it should meet the requirements of welding, industrial grade, general food grade, Coca-Cola enterprise, Pepsi enterprise, all kinds of high purity food grade beer industry, high purity grade special industry, and some special enterprise electronics grade at the same time. It can take into account all walks of life in the field of CO₂ application, including the occupation of some segmented sales market.



In terms of carbon dioxide gas treatment and recovery, Nanjing Ocean Group Co., Limited. is the only domestic manufacturer with independent intellectual property rights; Product recovery from 80Kg/h to 20,000Kg/h can be independently designed, manufactured, installed and debugged independently; purity of CO₂ finished product is $\geq 99.9995\%$ ($\leq 1\text{ppm}$). After the company was established, it quickly provided a large number of carbon dioxide recovery systems and related energy-saving reforms for many domestic beer companies, including Budweiser.

InBev Beer Group, China Resources Snow Beer Group, Tsingtao Brewery Group, Yanjing Beer Group, Carlsberg Beer Group, and other well-known beer groups at home and abroad.

Food Grade CDRS Series Carbon Dioxide Recovery Unit:

System composition: consists of sugar remover, defoaming washing system, air bag air control system, compression booster system, adsorption, drying system, refrigeration liquefaction system, purification system, liquid storage tank storage system, vaporization vacuum filtration system and other components.

Scope of application: It is mainly used for the recovery of carbon dioxide produced in the fermentation process of beer factories and alcohol factories. The recovered carbon dioxide can reach more than 99.99 ~ 99.998%.

Can be used for beer, carbonated beverage filling, deoxygenated water preparation, high concentration dilution and other applications.

Gas quality standards: The quality of the recovered CO₂ gas, which meets the International Beverage Technology Association (ISBT) standards;

GB / T2398-2021 and GB10621-2006 standards for liquid carbon dioxide for food additives. Meets and exceeds ISBT-2010, tested by third party and corresponding national standards.

Features: All key components are from international brands, and the system material is stainless steel. The design, manufacture and installation of the system are independently completed by our company. service convenient, excellent price, high degree of automation, PLC control, DCS system to control the entire device, real-time display and monitoring of key parameters,

If there is any difference, it will immediately report to the police, and can remotely monitor and accept remote instructions; it can realize complete unattended management.

FOOD GRADE CARBON DIOXIDE RECOVERY SYSTEM



Sugar remover



CO₂ compressor unit



Large energy-saving liquefaction system



A corner of the factory



Adsorption and drying system



Refrigeration liquefaction unit



Purification reboiler



Defoaming washing system

CO2 RECOVERY PROJECT PHOTOS





JUST TRUST **US** DO THE BEST
LET

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