

MINNUO GROUP PSA OXYGEN/NITROGEN GENERATOR

FOCUS ON GAS INDUSTRY FOR 32 YEARS
MASTER CORE TECHNOLOGY

PSA NITROGEN GENERATORS
PSA OXYGEN GENERATORS
VPSA OXYGEN GENERATORS
CRYOGENIC AIR SEPARATION SERIES

Jiangsu Minnuo Group Co., Ltd.
JANGSU MINNUO GAS EQUIPMENT CO., LTD

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MINNUO GAS EQUIPMENT

EXPORTED TO MORE THAN
150 COUNTRIES AROUND THE WORLD

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MINNUO GROUP

PROVIDE VARIOUS
GAS SUPPLY SOLUTIONS

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SAFE

RELIABLE

DURABLE

EFFICIENT

LOW NOISE





150+

Exported to
more than
150 countries

50+

Invention patents
and utility
model patents

2003 YEAR

Established
R&D
center

Jiangsu Minnuo Group Co., Ltd. is located in Jingjiang, which is the Chinese hometown of Gas Equipment. Our company is professionally engaged in developing and manufacturing gas equipment. As a professional manufacturer engaged in research, production and development of Air separation equipment, we can provide customers with PSA Nitrogen Generators, PSA Oxygen Generators, VPSA Oxygen Generators, Ammonia Decomposition to Hydrogen Generators for HDAQ series, Ammonia Decomposition and purification for HDFC series, gas purification equipment, gas recovery equipment, air purification engineering and other gas equipment, etc. We also can provide a variety of gas supply solutions according to customer requirements, and also provide users with repair and maintenance, technical training and technical advice in respect of nitrogen, oxygen, hydrogen generating equipment and related equipment.



PSA OXYGEN AND NITROGEN PRODUCTION EQUIPMENT

The device adopts double tower adsorption, and uses molecular sieve to absorb gas from the air. Separate excess gas to obtain high-purity oxygen or nitrogen.

OUR FACTORY

A COMPANY DEDICATED TO MANUFACTURING PROFESSIONAL GAS TREATMENT EQUIPMENT



Cooperate closely with professional design institutes and colleges and universities to give full play to the technical advantages of high-tech products, continuously carry out technological innovation, improve product performance and improve product quality.



The equipment has the advantages of compact structure, high degree of automation, stable performance, low energy consumption, low noise, and environmental friendliness.



THE COMPANY'S MAIN PRODUCTS

Pressure swing adsorption nitrogen generator, nitrogen purification device, pressure swing adsorption oxygen generator, VPSA oxygen generator, ammonia decomposition hydrogen production, purification device, nitrogen and hydrogen mixing automatic proportioning system, automatic hydrogenation device, cryogenic air separation equipment, etc. .

ENTERPRISE HONOR

Take customer as the center
quality as the foundation



■ TYPICAL INDUSTRY

-  METALLURGY
-  WATER TREATMENT
-  CHEMICAL INDUSTRY
-  OZONE PRODUCTION
-  COAL GASIFICATION
-  GLASS FURNACE
-  MEDICAL INDUSTRY
-  AQUACULTURE



ENERGY
SAVING



ENVIRONMENTAL
PROTECTION



LOW
NOISE

PSA OXYGEN GENERATOR

LOW MAINTENANCE COST
HIGH OXYGEN PRODUCTION AND LOW ENERGY CONSUMPTION
FULL AUTOMATION AND FAST START-UP
EASY TO INSTALL AND MAINTAIN





MEDICAL OXYGEN GENERATION SYSTEM

Medical oxygen generation and cylinder filling system uses PSA oxygen generator to directly produce medical oxygen from compressed air on site. After pressurization, the pressure for cylinder filling can reach 150 or 200bar, which can realize continuous production and

Cylinder filling of medical oxygen on site.

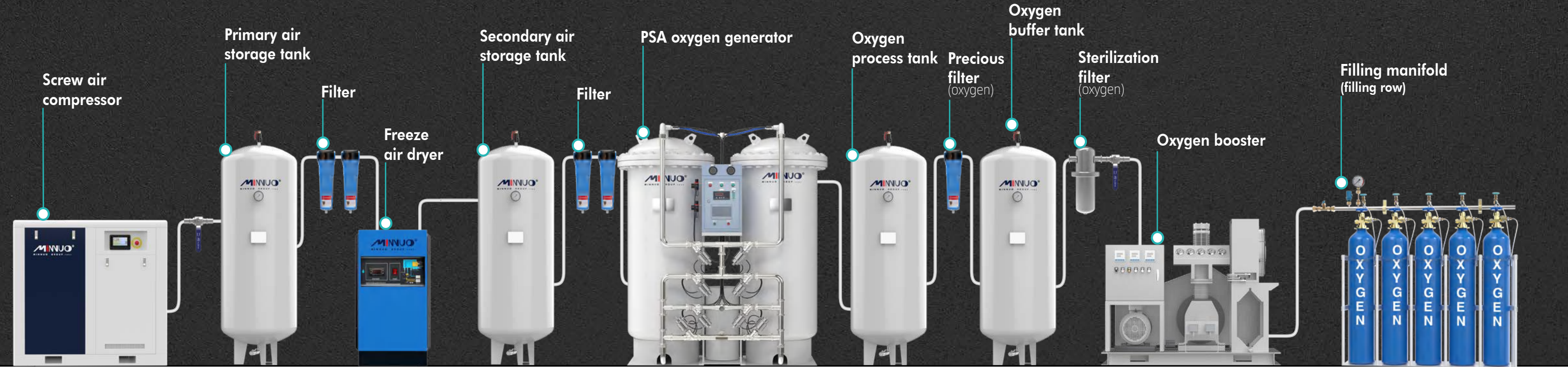
medical oxygen generation and cylinder filling system is a fully integrated skid mounted design, which covers a small area and is easy to operate.



EQUIPMENT SELECTIONS

BASED ON THE ACTUAL REQUIREMENT OF USER,
WE WILL PROVIDE THE ENERGY-SAVING PSA OXYGEN
GAS GENERATOR SOLUTION.

Purity	93±3% (Normal)
O2 Capacity	1-2000Nm3/h
Discharge O2 Pressure	0-5.5 Bar (Normal)
O2 Dew Point	−40℃ (Normal)
Operation	Full automatic



PSA OXYGEN PRODUCTION FLOW CHART

OPTIONAL ATLAS AIR
COMPRESSOR AND
REFRIGERATED DRYER



RELIABLE
QUALITY



SUPPORT
CUSTOMIZATION



ON TIME
DELIVERY

OXYGEN EQUIPMENT DESIGNED
BY **MINNUO**, MAINLY COMPOSED
OF THE FOLLOWING COMPONENTS

- AIR COMPRESSOR
- COMPRESSED AIR PURIFICATION COMPONENTS (FILTERS AND AIR DRYER)
- AIR BUFFER TANK
- PSA O²&N² SEPARATION SYSTEM
- O² STORAGE TANK

MNPO5-2000 TYPE MEDICAL &
INDUSTRIAL OXYGEN GENERATOR

Model No.	Capacity (Nm3/h)	Air Material (Nm3/h)	Purity (%)	Power (W)	Length x Width (mm)
MNPO-5/93	5	50	93±3	200	1600X1200
MNPO-10/93	10	100	93±3	200	1800X1500
MNPO-20/93	20	200	93±3	200	2000X1600
MNPO-30/93	30	300	93±3	200	2200X1800
MNPO-40/93	40	400	93±3	200	2400X1800
MNPO-50/93	50	500	93±3	200	2600X1800
MNPO-60/93	60	600	93±3	200	2600X1800
MNPO-80/93	80	800	93±3	200	2800X1800
MNPO-100/93	100	1000	93±3	200	3500X2200
MNPO-120/93	120	1200	93±3	200	3600X2200
MNPO-150/93	150	1500	93±3	200	3800X2300
MNPO-180/93	180	1800	93±3	200	4000X2300
MNPO-200/93	200	2000	93±3	500	5200X2300
MNPO-300/93	300	3000	93±3	500	5800X2300
MNPO-400/93	400	4000	93±3	500	6000X2300
MNPO-500/93	500	5000	93±3	500	7000X2300
MNPO-1000/93	1000	10000	93±3	1000	9000X2300
MNPO-2000/93	2000	20000	93±3	1000	12000X2300

MNPO5-2000 TYPE MEDICAL &
PLATEAU OXYGEN GENERATOR

Model No.	Capacity (Nm3/h)	Air Material (Nm3/h)	Purity (%)	Power (W)	Length x Width (mm)
MNPO-5/93	5	60	93±3	200	1600X1200
MNPO-10/93	10	120	93±3	200	1800X1500
MNPO-20/93	20	240	93±3	200	2000X1600
MNPO-30/93	30	360	93±3	200	2200X1800
MNPO-40/93	40	480	93±3	200	2200X1800
MNPO-50/93	50	600	93±3	200	2600X1800
MNPO-60/93	60	720	93±3	200	2800X1800
MNPO-70/93	70	840	93±3	200	3000X2000
MNPO-80/93	80	960	93±3	200	3200X3200
MNPO-90/93	90	1080	93±3	200	3300X2000
MNPO-100/93	100	1200	93±3	200	3500X2300
MNPO-200/93	200	2400	93±3	200	5200X3000

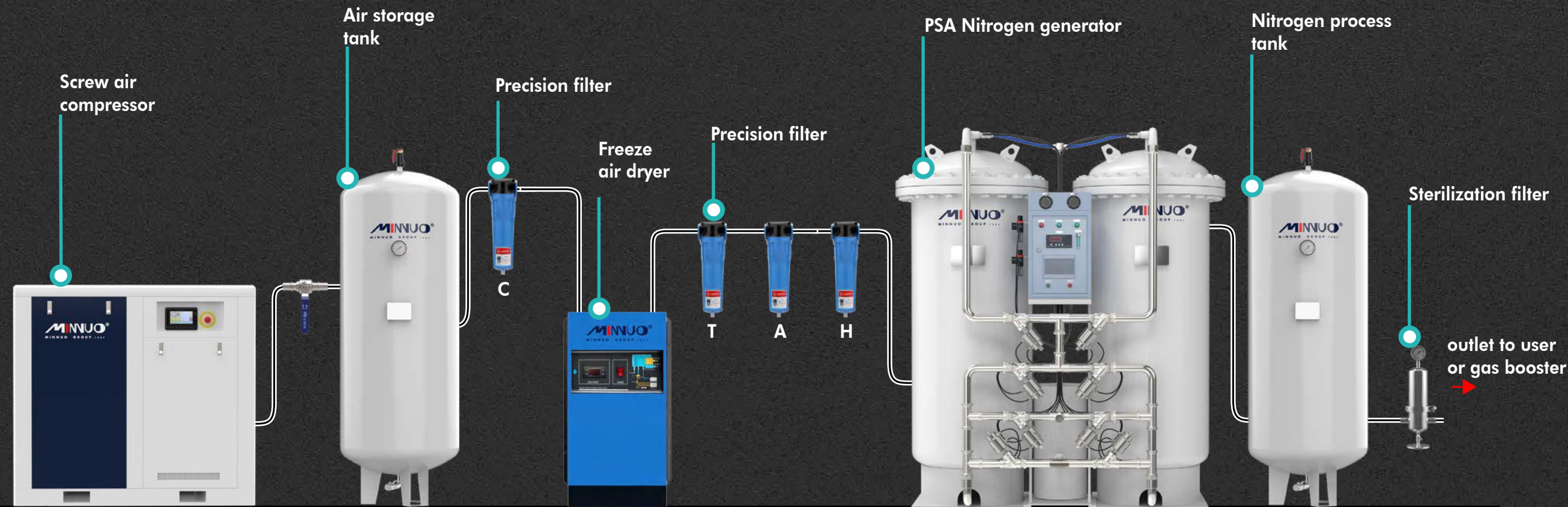


EQUIPMENT SELECTIONS

BASED ON THE ACTUAL REQUIREMENT OF USER, WE WILL PROVIDE THE ENERGY-SAVING PSA NITROGEN GAS GENERATOR SOLUTION.



Purity	95%-99.9995%
N2 Capacity	1-2000Nm3/h
Discharge N2 Pressure	0-5.5 Bar (Normal)
N2 Dew Point	-40℃ (Normal)
Operation	Full automatic



PSA NITROGEN PRODUCTION FLOW CHART

OPTIONAL ATLAS AIR COMPRESSOR
AND SUPPORT
COLOR CUSTOMIZATION



RELIABLE
QUALITY



SUPPORT
CUSTOMIZATION



ON TIME
DELIVERY

PSA NITROGEN GENERATOR
GENERALLY CONSISTS
OF FIVE PARTS

- A COMPRESSED AIR PURIFICATION SYSTEM
- B AIR TANK SYSTEM
- C O²/N² SEPARATION SYSTEM
- D N² BUFFER SYSTEM
- E ELECTRICAL CONTROL SYSTEM

MNPN5-2000 TYPE MEDICAL &
INDUSTRIAL NITROGEN GENERATOR

Model	Purity	Capacity	Model	Purity	Capacity	Model	Purity	Capacity
MNPN-1/95	95%	1	MNPN-1/99	99%	1	MNPN-1/99.5	99.5%	1
MNPN-5/95		5	MNPN-5/99		5	MNPN-5/99.5		5
MNPN-10/95		10	MNPN-10/99		10	MNPN-10/99.5		10
MNPN-20/95		20	MNPN-20/99		20	MNPN-20/99.5		20
MNPN-30/95		30	MNPN-30/99		30	MNPN-30/99.5		30
MNPN-40/95		40	MNPN-40/99		40	MNPN-40/99.5		40
MNPN-50/95		50	MNPN-50/99		50	MNPN-50/99.5		50
MNPN-100/95		100	MNPN-100/99		100	MNPN-100/99.5		100
MNPN-120/95		120	MNPN-120/99		120	MNPN-120/99.5		120
MNPN-150/95		150	MNPN-150/99		150	MNPN-150/99.5		150
MNPN-200/95		200	MNPN-200/99		200	MNPN-200/99.5		200
MNPN-500/95		500	MNPN-500/99		500	MNPN-500/99.5		500
MNPN-800/95		800	MNPN-800/99		800	MNPN-800/99.5		800
MNPN-1000/95		1000	MNPN-1000/99		1000	MNPN-1000/99.5		1000
MNPN-2000/95		2000	MNPN-2000/99		2000	MNPN-2000/99.5		2000
MNPN-1/99.9	99.9%	1	MNPN-1/99.99	99.99%	1	MNPN-1/99.999	99.999%	1
MNPN-5/99.9		5	MNPN-5/99.99		5	MNPN-5/99.999		5
MNPN-10/99.9		10	MNPN-10/99.99		10	MNPN-10/99.999		10
MNPN-20/99.9		20	MNPN-20/99.99		20	MNPN-20/99.999		20
MNPN-30/99.9		30	MNPN-30/99.99		30	MNPN-30/99.999		30
MNPN-40/99.9		40	MNPN-40/99.99		40	MNPN-40/99.999		40
MNPN-50/99.9		50	MNPN-50/99.99		50	MNPN-50/99.999		50
MNPN-100/99.9		100	MNPN-100/99.99		100	MNPN-100/99.999		100
MNPN-120/99.9		120	MNPN-120/99.99		120	MNPN-120/99.999		120
MNPN-150/99.9		150	MNPN-150/99.99		150	MNPN-150/99.999		150
MNPN-200/99.9		200	MNPN-200/99.99		200	MNPN-200/99.999		200
MNPN-500/99.9		500	MNPN-500/99.99		500	MNPN-500/99.999		500
MNPN-800/99.9		800	MNPN-800/99.99		800	MNPN-800/99.999		800
MNPN-1000/99.9		1000	MNPN-1000/99.99		1000	MNPN-1000/99.999		1000
MNPN-2000/99.9		2000	MNPN-2000/99.99		2000	MNPN-2000/99.999		2000



**MINNUO
AIR COMPRESSOR**



**ATLAS COPCO
AIR COMPRESSOR**

AIR COMPRESSOR OPTION

You can choose the equipment brand you need according to your actual needs and equipment operating environment.



**MINNUO
AIR DRYER**

AIR DRYER OPTION

You can choose the equipment brand you need according to your actual needs and equipment operating environment.



**ATLAS COPCO
AIR DRYER**

STAINLESS STEEL CONNECTING PIPE

- A** The pipeline does not rust, effectively protecting the downstream gas equipment
- B** Quick connection, easy installation
- C** The inner wall is smooth, the gas pressure drop is small, and the energy is saved
- D** The sealing performance is reliable, the pipeline does not leak, and it can be used for 20 years
- E** The inner wall of 304 stainless steel is clean and pollution-free, which can be used in the food and medical industry



PRECISION FILTER

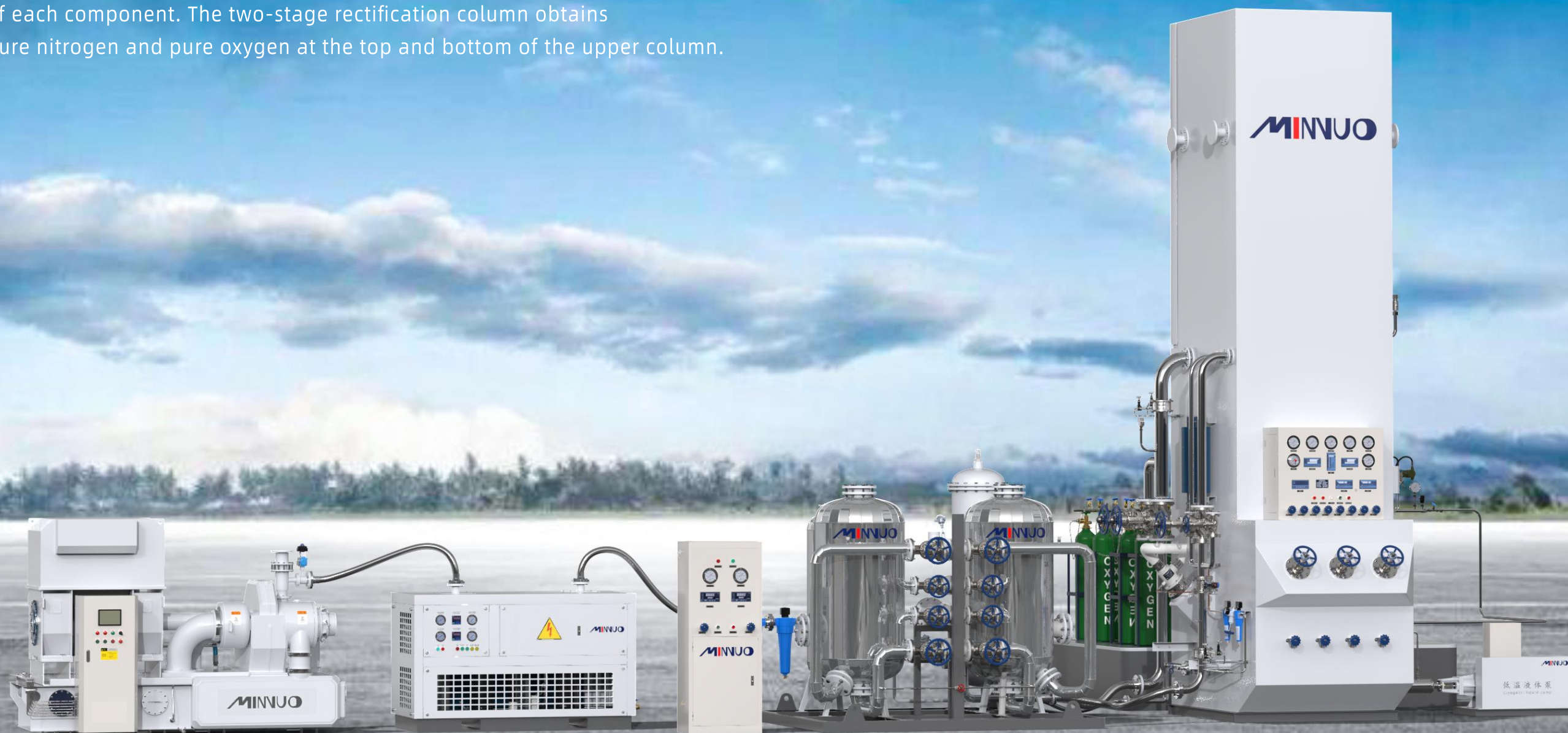
EFFICIENT REMOVAL OF POLLUTANTS IN COMPRESSED AIR

Provide users with high-quality compressed air filtration, dedicated to laser cutting, bottle blowing, advanced spraying, food, electronics, petrochemical and other industries. By installing CJ series ultra-clean precision filters, compressor air pollutants (such as oil, water, dust, etc.) are effectively removed.



CRYOGENIC AIR SEPARATION SERIES

The air is condensed into liquid by cryogenic rectification, and the air is separated according to the evaporation temperature of each component. The two-stage rectification column obtains pure nitrogen and pure oxygen at the top and bottom of the upper column.



PROCESS FLOW

Improve process means to ensure product quality

SEPARATION UNIT

High Performance Oil free Air expander Unit
having Adiabatic efficiency upto 95%

PURIFICATION UNIT

Pre-piped Completely for quick Installation Process
Air Pre-cooled in Freon Unit Prior & After to
Drying Units for Higher level of Efficiency

AIR COMPRESSOR

A Four Stage Continuous Duty Air Compressor
(Manufactured by Ingersol Rand) Provided Inter
coolers between stage for Efficient
Compression of Air

AIR COMPRESSOR

Air be compressed to 0 . 5-0 . 7mpa by air compressor.

PRE-COOLING

The air is pre-cooled to 5-10 , in the pre-cooling unit ,
and the moisture is separated.

AIR PURIFICATION SYSTEM

Removing the remained moisture , carbon dioxide and
hydrocarbons of compressed air in the molecular
sieve purifie.

AIR EXPANSION

The air expands and cools in the turbo expander and
provides the cooling capacity required by the device.

HEAT EXCHANGE

The air exchanges heat with the refluxing oxygen ,
nitrogen , and dirty nitrogen in the heat exchanger of
the fractionation tower , and is cooled close to the
liquefaction temperature and the refluxed oxygen ,
nitrogen , and dirty nitrogen are repeatedly heat
exchanged to the ambient temperature.

COOLING

Cooling the liquid air and liquid nitrogen before the
throttling of the nitrogen in the chiller.

DISTILLATION

The air is rectified and separated in the rectification tower,
and the product nitrogen is obtained at the top of the
upper tower , and the product oxygen is obtained at the
bottom of the upper tower .

AIR COMPRESSION SYSTEM

Imported centrifugal air compressor ,
high efficiency
low consumption
stable and reliable operation



AIR PURIFICATION SYSTEM

The purifier adopts a vertical single-layer bed with simple and reliable structure and low resistance loss , built-in filter.
Blowing off and purifier regeneration at the same time ,
high-efficiency electric heater ensures complete regeneration of molecular sieve.

FRACTIONATING COLUMN



1. Fractionating column
2. Filling Station
3. Liquid Pump

FRACTIONATING COLUMN SYSTEM (COLD BOX)

The heating , cooling , liquid accumulation and purification of the fractionating tower can be completed in one way , and the operation is simple , quick and easy . Adopt aluminum plate-fin heat exchanger , aluminum convection sieve plate tower , the entire fractionating tower equipment pipeline adopts argon arc welding , the tower body and main pipeline in the cold box are made of high-strength aluminum alloy or stainless steel to increase the strength , Reduce the torsion damage of the pipeline . The equipment brackets , pipes and valve brackets in the cold box shall be made of stainless steel or aluminum alloy cold box is insulated with and to ensure that the loss of cold capacity is minimized .

The cold box structure guarantees the overstrength and the requirements of anti-seismic and wind resistance , and guarantees the loadbearing capacity of the cold box . When the cold box is running , it is equipped with airtight protection safety devices.



MNDO CRYOGENIC OXYGEN AIR SEPARATION UNIT

The cryogenic oxygen production oxygen & nitrogen production process introduces a lowpressure process into the air separation equipment , which reduces the energy consumption of theair separation and improves the safety of operation . Corresponding chemical software is used inprocess calculation and unit equipment design for process distillation calculation and structurecalculation to ensure advanced and reliable equipment.

TECHNICAL INDICATORS

Cryogenic Oxygen Air Separation Unit (MNKDO)			
Name	Oxygen Gas	Pressure	20MpaG (Adjustable)
Purity	>99.6%	Operation Cycle	12 Months
Start Time	~ 24 Hours	Single Column, Internal compression Process	

TECHNICAL INDICATORS

Cryogenic Oxygen Air Separation Unit (MNKDO)			
Name	Oxygen&Nitrogen Gas	Pressure	20MpaG(Adjustable)
Oxygen Purity	>99.6%O ₂	Nitrogen Purity	>99.99%
Start Pressure	1.0MPaG	Double column, External compression Process	

SPECIFICATIONS CLASSIFICATION

Model	Unit	MN-KDON -50-50	MNKDON -80/160	MNKDON -180-300	MNKDON -260-500	MNKDON -350-700	MNKDON -550-1000	MNKDON -750-1500	MNKDONAR- 1200-3000-30Y
Oxygen Production	Nm³/h	50	80	180	260	350	550	750	1200
Oxygen purity	%O ₂	≥99.6	≥99.6	≥99.6	≥99.6	≥99.6	≥99.6	≥99.6	≥99.6
Nitrogen Production	Nm³/h	50	160	300	500	700	1000	1500	2000
Nitrogen Purity	PPmO ₂	≤10	≤10	≤10	≤10	≤10	≤10	≤10	≤5
Liquid Argon Production	Nm³/h	—	—	—	—	—	—	—	30
Liquid Argon Purity	PPmO ₂ + PPmN ₂	—	—	—	—	—	—	—	≤1.5PpmO ₂ +4PPmN ₂
Liquid Argon Pressure	MPa. A	—	—	—	—	—	—	—	—
Unit Consumption	Kwh/ Nm³O ₂	≤1.3	≤0.85	≤0.68	≤0.68	≤0.65	≤0.65	≤0.63	≤0.55
Device Occupied Area	m²	145	150	160	180	250	420	450	800

MNDONAR-Y CRYOGENIC LIQUID AIR SEPARATION UNIT

Liquid air separation equipment requires more coolingcapacity than gas air separation equipmentAccording to the different production of liquid air separation equipment , we adopt a variety of different refrigeration cycleprocesses , turbine expander refrigeration , low temperaturepre-cooling refrigeration , circulating compressor high andlow pressure expander refrigeration, etc , through various methods to achieve reduction Energy consumption goalshe control system adopts DCS or PLC control system , and auxiliary field instruments, so that the whole set of equipment is simple to operate , stable and reliable.



SPECIFICATIONS CLASSIFICATION

Model	Unit	MNKDO -180Y	MNKDO -250Y	MNKDO -400Y	MNKDON -1200Y/300Y	MNKDONAR -1300Y/200Y/40Y	MNKDONAR -2700Y/300Y/90Y
Liquid Oxygen Production	Nm³/h	180	250	400	1200	1300	2700
Liquid Oxygen Purity	%O ₂	≥99.6	≥99.6	≥99.6	≥99.6	≥99.6	≥99.6
Liquid Oxygen Pressure	MPa.A	0.2	0.2	0.2	0.2	0.2	0.2
Liquid Nitrogen Production	Nm³/h	—	—	—	300	200	300
Liquid Nitrogen Purity	PPmO ₂	—	—	—	≤5	≤5	≤5
Liquid Nitrogen Pressure	MPa.A	—	—	—	0.5	0.5	0.5
Liquid Argon Production	Nm³/h	—	—	—	—	40	90
Liquid Argon Purity	PpmO ₂ +PPmN ₂	—	—	—	—	≤1.5PpmO ₂ +4PPmN ₂	≤1.5PpmO ₂ +4PPmN ₂
Liquid Argon Pressure	MPa.A	—	—	—	—	0.2	0.2
Device Occupied Area	m²	250	300	350	850	-4000	-4500



AFTER-SALES SERVICE

The key engineers have been engaged in the after-sales service of this system for more than 8 years, and all the after-sales service engineers have undergone strict selection and training. Maintain close cooperation with the suppliers of auxiliary facilities and components, and provide spare parts and accessories timely. 7* 24 service.

Be equipped with the Wi-Ctrl remote wireless monitoring system developed by our company. When the equipment has alarm information, it will automatically send the information to the remote data center and send an email to the mailbox of the local equipment maintenance engineer, and automatic telephone notification, can promptly let remote and local joint maintenance equipment. After-sales engineers have passed professional training and assessment and obtained authorized service certificates for air compressors, refrigeration dryers and other equipment.