

## Pressure Swing Adsorption Psa Nitrogen Generator System

Our Product Introduction

### Basic Information

- Place of Origin: SUZHOU, CHINA
- Brand Name: SUMAIRUI GAS
- Certification: ISO9001, CE, BV, SGS, TUV, ASME, GOST,NB,NR ETC
- Model Number: OSL-20
- Minimum Order Quantity: 1 set
- Price: Negotiable
- Packaging Details: Exporting wooden case /Film packing
- Delivery Time: 30-45 days
- Payment Terms: L/C, T/T, Western Union, MoneyGram
- Supply Ability: 100 sets/months



### Product Specification

- Voltage: 220-575V 50-60Hz
- Production Rate: 30-100%
- Usage: For General Industrial Working
- Condition: Brand New
- Weight: Actual Weight
- After-sales Service Provided: Available Send Engineers Coming For Assistant Installation & Commission
- Dimension(l\*w\*h): Actual Size
- Power(w): 0.5 Kw
- Purity: 99%-99.999%
- Capacity: 1-5000 Nm3/hr
- Application: Laser Cutting
- Color: Customized
- Product Name: Sumairui Gas
- Type: PSA Modular

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## Product Description

### OSL modular nitrogen generator used for fiber laser and food cutting field with ASME certificates 30 cfm purity 99.99%

Nitrogen production that is carried out using pressure swing adsorption (PSA) technology over a carbon molecular sieve (CMS) is considered to be a mature, cost-effective and highly efficient method to produce nitrogen to meet a wide range of purity and flow requirements. Ongoing increases in efficiency in PSA-based nitrogen-generation facilities are being driven by enhanced CMS materials (Figure 1) and process improvements. This article provides an overview of the fundamentals of PSA-based nitrogen generation, while focusing specifically on innovative practices and improved CMS materials. Together, these advances contribute to continuous improvement in PSA system performance, giving chemical process industries (CPI) plant operators a proven way to produce a reliable and low-cost supply of high-purity dry nitrogen onsite.



FIGURE 1. Carbon molecular sieve (CMS) pellets, typically manufactured from coconut shells, provide the surface area and pore structure needed to separate oxygen and nitrogen from a compressed air inlet stream

Nitrogen — in both the gaseous and liquid state — is used in a wide range of applications in many industrial sectors. These include the production of foods and beverages, chemicals and pharmaceuticals; petroleum processing; the thermal treatment of metals; the manufacture of flat glass, semiconductors and electronics; and many more. Industrial facilities that require large volumes of nitrogen always look for efficient methods of onsite nitrogen production to meet all of the specifications related to purity, flow requirements, power consumption, footprint and portability

Nitrogen gas is produced by separating air into its primary component molecules (nitrogen and oxygen), using one of two methods: 1. Traditional cryogenic fractionation of air that has been liquefied; or 2. Separation of gaseous air using pressure swing adsorption (PSA) or membrane-based separation systems. If large volumes of nitrogen with extremely high purity (99.998%) are required, cryogenic fractionation of air remains the most efficient and economical technology option [ 2 ]. This is the oldest method of nitrogen production, and it has the ability to produce both gaseous and liquid nitrogen (for daily use and as a backup supply). Cryogenic fractionation of air is typically carried out in large-scale commercial plants that then deliver the produced nitrogen to users.

However, at many CPI facilities, enriched nitrogen is produced onsite using smaller-scale PSA separation or membrane-based separation systems. PSA systems operate on the principle of physical adsorption of the oxygen in air by carbon molecular sieve materials (such as those shown in Figure 1), leaving an enriched nitrogen stream as the product; the process is illustrated in Figure 2. Today's PSA systems can economically produce nitrogen from compressed air at a variety of volumes. For instance, today's systems can handle an inlet air stream of less than 5,000 to more than 60,000 std. ft<sup>3</sup>/h, reliably producing N<sub>2</sub> that meets purity requirements from 95 to 99.9995%

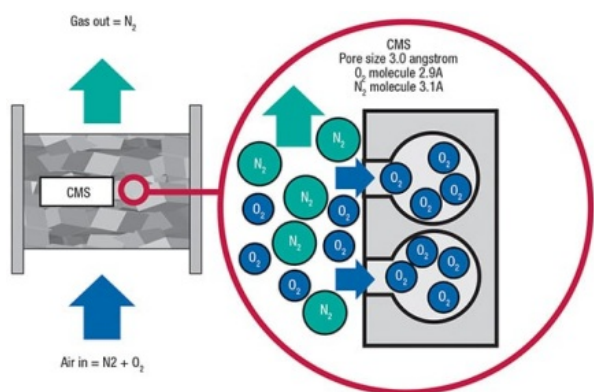


FIGURE 2. Within the CMS pellets, oxygen is preferentially adsorbed, allowing a nitrogen-rich product stream to be captured for use onsite

However, the capital and operating costs of a PSA system are directly correlated with the purity of the nitrogen produced, and these costs climb rapidly once nitrogen with purity greater than 99.5% is required. In some cases, it can be cost-effective to produce higher-purity nitrogen by first producing 99.5%-purity nitrogen using a PSA system, and then using a palladium or copper unit to remove residual levels of oxygen in the nitrogen product. Such systems can bring down residual oxygen to 1–3 ppm.

#### SELECTING THE RIGHT SYSTEM

When selecting the most appropriate nitrogen-production process, several parameters should be considered. Purity and capacity are the most important factors that can affect the choice of production methodology, and hence, have a direct impact on the unit cost of the nitrogen produced. The use of a PSA nitrogen-generation system, which can be designed to meet all types and patterns of nitrogen flow — steady, periodic and erratic — has grown in popularity during the last several decades, thanks to the simplicity, performance, flexibility, reliability and relatively low capital and operating costs of this production route. However, the optimal nitrogen-production rate using a PSA system based on CMS pellets is around 3,000 Nm<sup>3</sup>/h of N<sub>2</sub> produced (>95% purity). Within that range, PSA is a more economical option than O<sub>2</sub>/N<sub>2</sub>-separation by air liquefaction and cryogenic separation, or by membrane-based separation. The principles of PSA-based nitrogen-generation technology using

CMS and several important aspects of process engineering knowhow are discussed below.

#### CARBON MOLECULAR SIEVES

CMS is part of a special class of activated carbons that have non-crystalline (amorphous) structure with a relatively narrow pore-size distribution. This material provides molecular separations based on the rate of adsorption of nitrogen, rather than the differences in adsorption capacity between oxygen and nitrogen. Figure 2 shows the inner structure of a CMS material that is appropriate for the separation (removal) of O<sub>2</sub> molecules from N<sub>2</sub> molecules in the compressed-air inlet, to yield an enriched nitrogen stream (Note: Carbon molecular sieves are selective for oxygen, while zeolite molecular sieves are selective for nitrogen).

Features include:

- Dualbed and Monobed design
- Complete package with pre-filtration and buffer tank
- Safe and reliable
- Produce 95 - 99.999% pure nitrogen continuously
- Dewpoints to -58°F (-50°C)

Final stage sterile air filter is USDA / FSIS accepted for use in federally inspected meat and poultry plants. In full compliance with FDA and GFSI requirements

PSA towers require no maintenance



#### Main Parameters

Model	Nitrogen Output (m <sup>3</sup> / hr)								Air Inlet	N2 Outlet
	95%	99%	99.5%	99.9%	99.95%	99.99%	99.995%	99.999%		
OSL5	11.4	8.1	6.8	5.4	4.5	3.5	2.8	2.0	G1/2	G1/2
OSL8	22.8	16.2	13.5	10.8	8.9	6.9	5.7	4.3	G1/2	G1/2
OSL10	34.2	24.3	20.3	16.2	13.4	10.5	8.8	7.1	G1/2	G1/2
OSL15	45.6	32.4	27.0	21.6	17.7	13.8	11.7	9.6	G1/2	G1/2
OSL20	57.0	40.5	32.4	26.6	20.8	17.2	14.6	12.0	G3/4	G1/2
OSL25	68.4	48.6	40.5	32.4	26.6	20.8	17.6	14.4	G3/4	G3/4
OSL30	79.8	56.7	47.3	37.8	31.1	24.3	20.6	16.8	G3/4	G3/4
OSL35	91.3	64.8	54.0	43.2	35.6	27.9	23.6	19.2	G1	G3/4
OSL40	102.7	72.9	60.8	48.6	39.7	30.7	26.2	21.6	G1	G3/4
OSL45	114.1	81.0	67.5	54.0	44.3	34.5	29.3	24.0	G1	G3/4

Reference working conditions: ambient temperature 25°C, working pressure 0.7MPa.  
Parameters are subject to change due to technical improvement without prior notice



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