

“ Why Choose VPSA System? ”

VPSA oxygenation system uses ambient air as the raw material, featuring low operating energy consumption and requiring no air compression, purification, or cryogenic systems. They can start up in just five minutes, with molecular sieves lasting up to ten years. The oxygen production cost per unit is significantly lower than that of other technologies, making VPSA the most energy-efficient, reliable, and cost-effective oxygen supply solution available on the market.

Method	Purification	Cryogenic	Air Source	Pressure	Start-up	Sieve Life	Energy Consumption kWh/Nm³	Operating* Cost USD/Nm³
VPSA	×	×	Ambient Air	±50 kPa	5 min	10 yrs	0.3	≈ 0.033
PSA	√	×	Compressed Air	0.4 MPa	5 min	5 yrs	1.1	≈ 0.121
Cryogenic	√	√	Cooled Air	1.2 MPa	20 h	5 yrs	0.6	≈ 0.066
LOX	×	√	Liquid O₂	1.2 MPa	5 min	5 yrs	/	≈ 0.2

*Including transportation and procurement costs.
*Based on the global average electricity price: \$0.11/kWh

VPSA Advantages



Low Operating Cost

Consumes less energy than PSA and cryogenic systems, with no transportation or storage costs — offering a more economical oxygen supply.



Environmentally Friendly

Uses ambient air as raw material, eliminating transport emissions and enabling low-carbon operation to support energy saving and emission reduction.



Fast Start-Up

Delivers high-purity oxygen within just 5 minutes of start-up, providing quick response for immediate oxygen demand.



Long Service Life

Equipped with lithium-based molecular sieves lasting up to 10 years — outperforming traditional PSA and cryogenic systems.



Oil-Free System

Both the blower and vacuum pump are oil-free, preventing any oil contamination and ensuring safe, clean system operation.



Enhanced Safety

Operates entirely under low pressure, minimizing risks associated with high-pressure cylinders and ensuring operator and site safety.



No Dryer Required

Built-in drying layer eliminates the need for external air purification equipment, resulting in a simpler and more compact system.



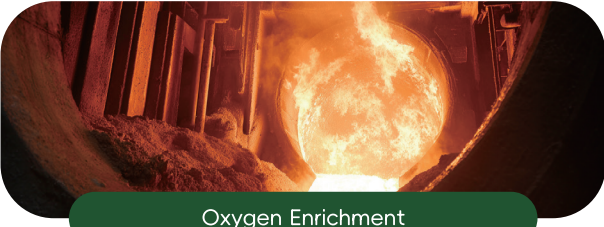
Quick Energy Payback

Variable-frequency blower and vacuum pump operate at only 60% of rated power, achieving significant energy savings and a short return-on-investment period.

Applications



Furnace Combustion



Oxygen Enrichment



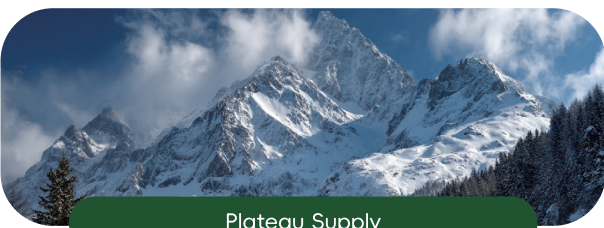
Glass Manufacturing



Ozone Purification



Aquaculture



Plateau Supply



Medical Supply



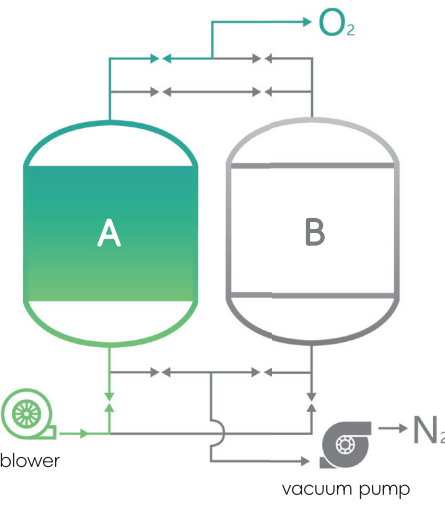
VPSA Oxygen Generation System

—An energy efficient solution for large-scale oxygen production

“ What is VPSA System ? ”

Vacuum Pressure Swing Adsorption (VPSA) oxygen generation system is designed to efficiently extract high-purity oxygen from ambient air. This technology operates through alternating low-pressure and vacuum adsorption cycles, ensuring stable oxygen purity while significantly reducing energy consumption – making it an ideal solution for large-scale oxygen demand.

Principle of VPSA Technology

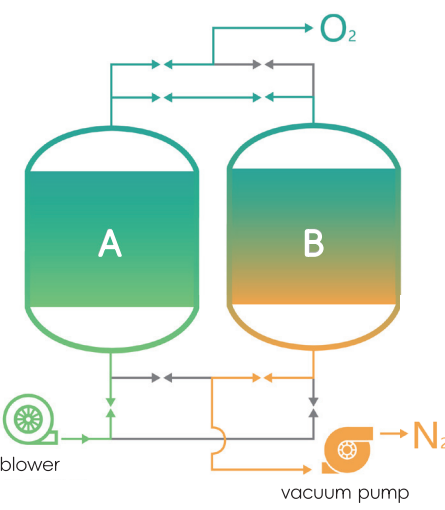
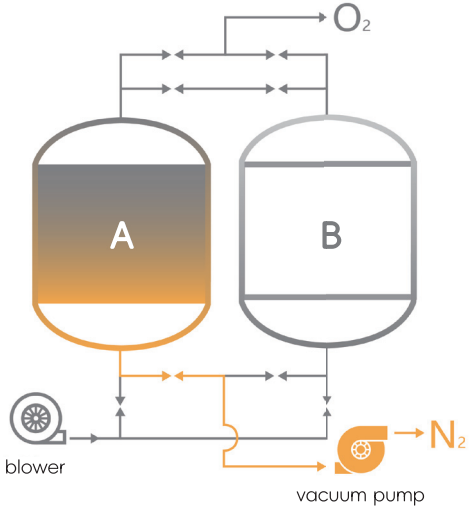


1 Adsorption Phase

Air is compressed by the air blower to approximately 50 kPa, then enters the adsorption tower filled with zeolite molecular sieves. The sieve selectively adsorbs nitrogen, allowing high-purity oxygen to pass through and be collected as the product gas.

2 Desorption and Regeneration Phase

Once the molecular sieve becomes saturated, the system automatically switches to the desorption phase. A vacuum pump reduces the tower pressure to around -50 kPa, releasing the adsorbed nitrogen while regenerating the molecular sieve for the next cycle.



3 Equalization and Backflush Phase

Before reaching the lowest pressure, part of the produced oxygen returns to the regenerating tower for pressure equalization and backflushing of residual nitrogen, improving regeneration efficiency. VPSA systems use two towers operating alternately to ensure continuous oxygen generation, low energy consumption, and stable performance.

☎ : +86 153-7202-6555

🌐 : www.kstxmanufacturing.com

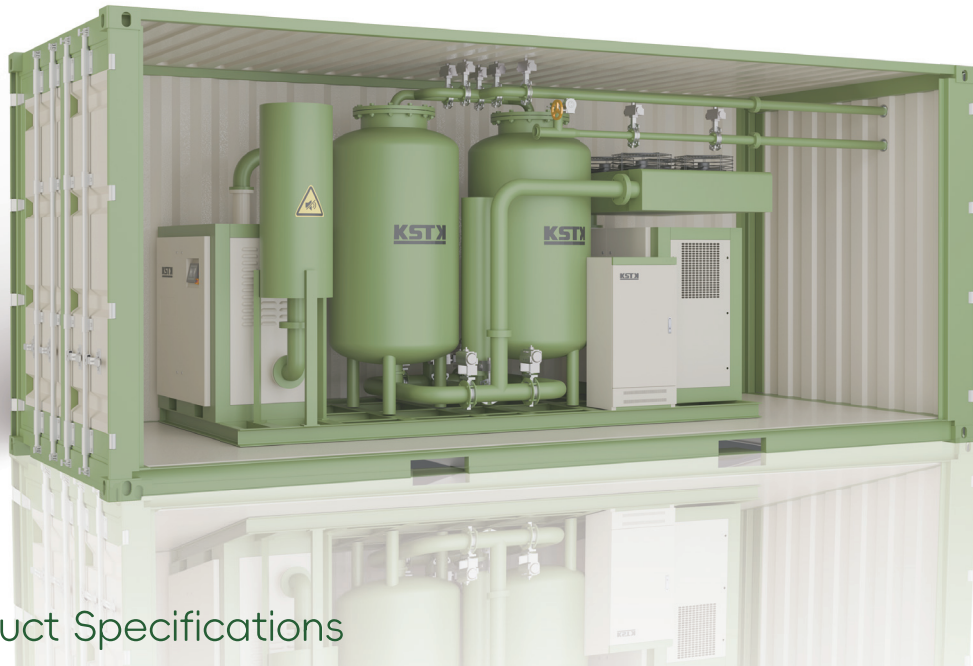
✉ : contact@kstxmanufacturing.com

OxyCube™ – Containerized VPSA Oxygen Station



OxyCube™ is a containerized VPSA oxygen station designed by KSTK, featuring a plug-and-play design for diverse environments. It integrates the air blower, vacuum pump, heat exchanger, control cabinet, power distribution cabinet, and the VPSA unit—with an optional oxygen booster—inside a standard ISO container. Requiring no installation or civil work, OxyCube™ delivers stable, high-purity oxygen on demand, removing the need for liquid oxygen or cylinders. Each unit is fully assembled, tested, and ready for immediate operation once connected to power.

With advanced insulation, ventilation, and intelligent temperature control, it operates reliably from -20°C to +40°C, ensuring continuous oxygen supply for remote sites, temporary hospitals, and industrial use.

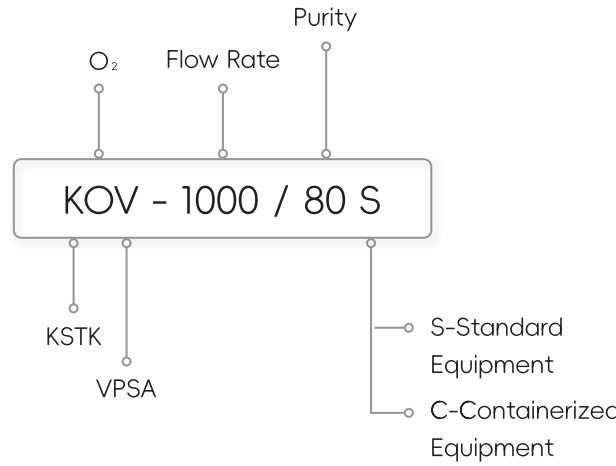


Product Specifications

Oxygen Output* (Nm ³ /hr)	Oxygen Purity* (%)	Oxygen Pressure* (MPa)	Installed Power (kW)	Operating Power (kW)	Container Selection
50	93	0.015	22	15	40HQ
150	93	0.015	78	45	40HQ
200	93	0.015	95	60	40HQ
300	93	0.015	150	90	2*40HQ
500	93	0.015	245	150	3*40HQ

* All performance parameters are calculated based on standard sea-level conditions.
* Flow rate, purity, pressure, and power supply voltage can be customized as required.

Model Definition



Key Components Advantages

Blower / Vacuum Pump

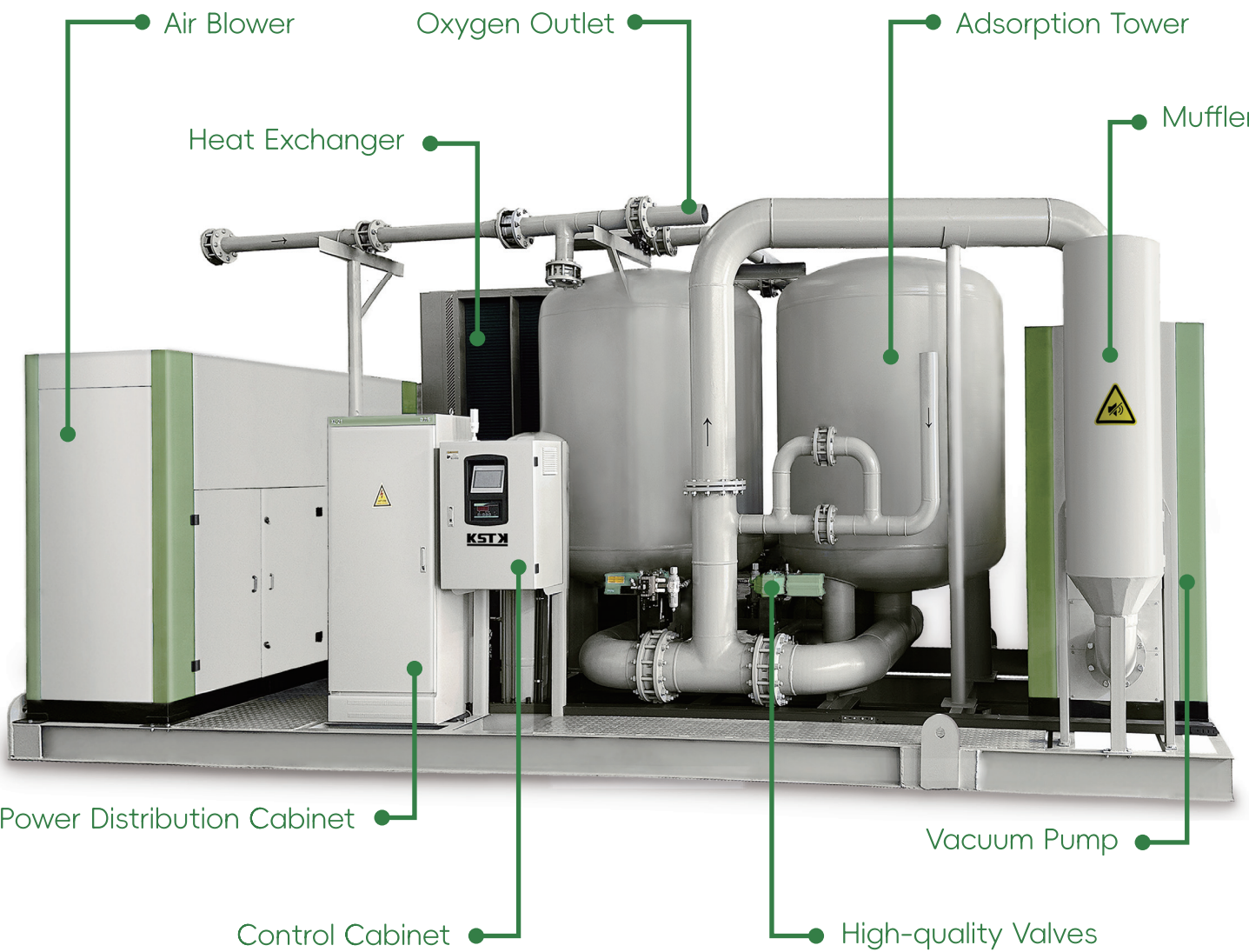
Oil-free, variable-frequency air blower and vacuum pump for a reliable and energy efficient operation.

Heat Exchanger

All-copper finned tube design with high-efficiency air cooling to ensure low pressure drop.

Control Cabinet

Integrated siemens PLC featuring a 7-inch touchscreen and remote operation capability.



Technical Specifications

Oxygen Purity	80 ~ 93%
Oxygen Flow Rate	40 ~ 7500Nm ³ /hr
Oxygen Dew Point	-50 ~ -30°C
Oxygen Pressure	0.015 ~ 20MPa (with booster)
Operating Pressure	±0.05MPa
Inlet Air Temperature	20 ~ 35°C
Power Supply Voltage	Customizable

Muffler

Composite impedance silencer, reducing noise from 95 dB to 70 dB.

High-quality Valves

Stainless steel double-eccentric, double-packing valves with low torque and zero leakage.

Adsorption Tower

Newly designed high-efficiency airflow distribution tower with real-time pressure and temperature monitoring.

OxyVance™ – Large-Scale VPSA Oxygen Generator



OxyVance™ is KSTK's large-scale VPSA oxygen generation system, utilizing lithium-based molecular sieves to efficiently produce oxygen at ambient temperature and low pressure, without the need for cryogenic processes. Compared to liquid oxygen tanks and cylinder delivery, OxyVance™ generates oxygen on demand at the site, offering a more sustainable and cost-effective solution.

Engineered by KSTK's technical team, the system features a compact modular design with radial-flow adsorption towers, significantly enhancing oxygen production efficiency and reliability. OxyVance™ can produce oxygen within 5 minutes of start-up and supports flexible configurations such as multi-tower parallel operation. Its built-in intelligent energy-saving mode further helps customers reduce operating costs.



Product Specifications

Oxygen Output* (Nm ³ /hr)	Oxygen Purity* (%)	Oxygen Pressure* (MPa)	Installed Power (kW)	Operating Power (kW)	Water Consumption (T/h) Cooling Water Soft Water
2000	93	0.015	1000	580	70 2
3000	93	0.015	1400	870	85 2.5
4500	93	0.015	2000	1300	100 3
5500	93	0.015	2500	1600	120 3
7500	93	0.015	2500	1600	120 3

* All performance parameters are calculated based on standard sea-level conditions.
* Flow rate, purity, pressure, and power supply voltage can be customized as required.