AirSep VPSA Oxygen Systems

For Large-Capacity Demand Applications

AirSep® Corporation – An Organization with a Global Presence

Quality and long-term value are built into every AirSep product for total customer satisfaction. AirSep's commitment to world leadership in expertise, capabilities and products inspires technologically advanced, innovative solutions for every aspect of oxygen supply needs.

Vacuum Pressure Swing Adsorption (VPSA) Systems

AirSep is the world leader in Vacuum Pressure Swing Adsorption (VPSA) technology. AirSep VPSA oxygen plants use two vessels filled with molecular sieve as adsorbers. As compressed air passes through one of the adsorbers, the molecular sieve adsorbs the nitrogen. This allows the remaining oxygen to pass through and exit the adsorber as a product gas. Before the adsorber becomes saturated with nitrogen, the inlet air flow switches to the second adsorber. The first adsorber is now regenerated by desorbing the nitrogen through depressurization and purging it with oxygen. The complete cycle is then repeated. Under normal operating conditions, the molecular sieve is completely regenerative and will last indefinitely.

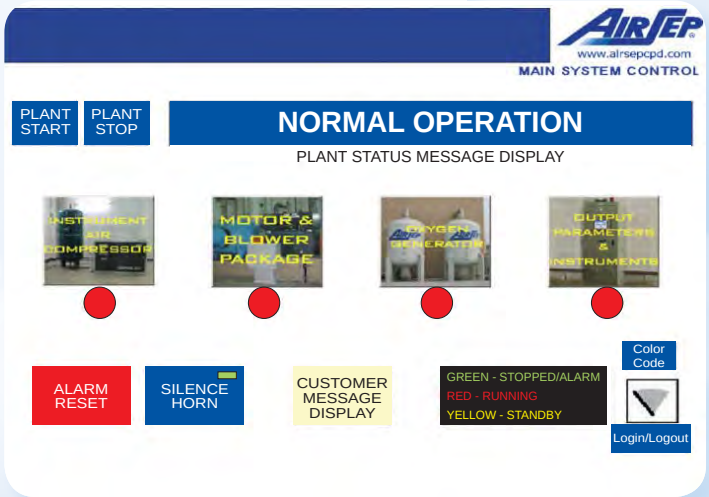
AirSep VPSA Control Systems

Every AirSep VPSA plant control system monitors and controls the operation of the process valves. In the event of a power or instrument air failure, or even a loss in product concentration, the control system will shutdown in fail-safe mode. The plant's integrated hardware and software monitor critical plant parameters, as well as the performance of the feed and vacuum blowers, instrument air compressor, and oxygen compressor.

Advanced Features and Controls:

Control and Monitoring

- Designed in accordance with local and international standards
- User-friendly design
- Integrated hardware and software
- Viewable trends and pressure profiles
- Continuous data recording every 250 milliseconds
- Process optimization may be performed by the operator if needed
- Remote monitoring capability
- Multi-level secured access for supervisory control
- Multi-language option
- Alarm and process parameters notification via email
- Parameters displayed in metric or imperial units



VPSA Major Components

Blowers and Motor

Aftercooler

Oxygen Compressor

Instrument Air Compressor

Feed & Waste Manifold and Product Manifold

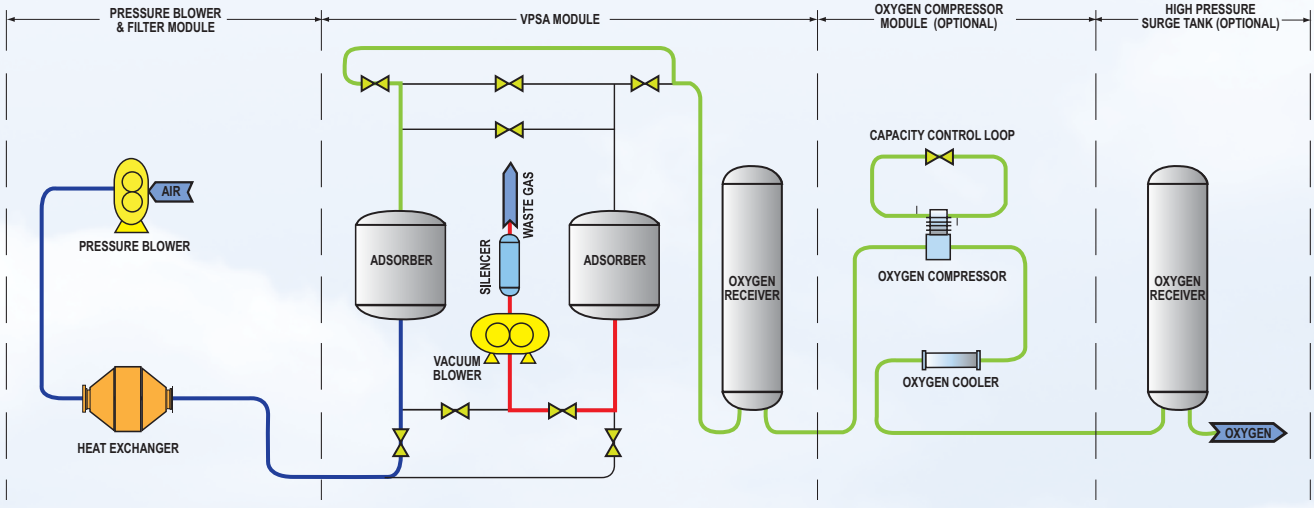
Adsorbers

Inlet and Discharge Silencers

Control Panel

Oxygen Receivers

VPSA Plant Schematic – Typical



Typical Applications & Industries Served

- Environmental Remediation
- Fish Farming/Hatcheries (Aquaculture)
- Furnace Enrichment
- Glass Blowing and Manufacturing
- Gold Leaching
- Mining Industry
- Ozone Generator (Feed Gas)
- Oxygen Bleaching and Delignification
- Oxygen Fuel Burners
- Petroleum Refineries
- Pulp and Paper Mills
- Steel Mills
- Uranium Recovery
- Water Treatment
- Wastewater Treatment









Worldwide Installations

AirSep offers custom-engineered VPSA Oxygen Systems designed to each customer's specific site requirements, with capacities from 2,000 SCFH (53 Nm^3/hr) to 120,000 SCFH (3,155 Nm^3/hr).

AirSep's high-efficiency, rugged 2-bed VPSA oxygen process design offers extremely low energy consumption, on-line efficiency of 99%, easy operation, and long-term equipment life of 25 years or more.

AirSep VPSA Oxygen Systems are currently in use throughout the world in remote, harsh, and/or demanding environments.

ASV27000 VPSA Oxygen Plant at a Wastewater Treatment Facility — Rocky Mount, NC USA

Two ASV45000 VPSA Oxygen Plants at a Wastewater Treatment Facility — San Francisco, CA USA

Two ASV33000 VPSA Oxygen Plants at a Gold Mine — Kazakhstan

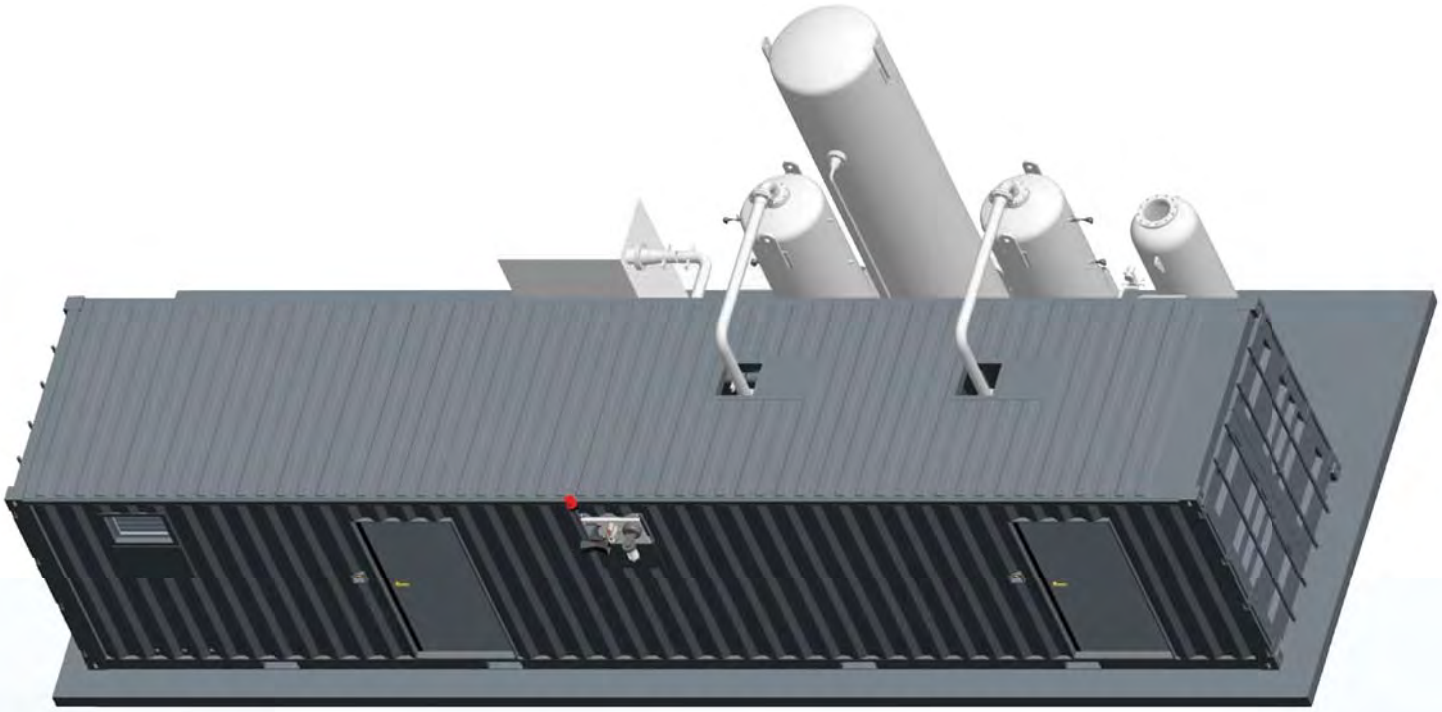
Two ASV25000 VPSA Oxygen Plants at a Uranium Mine — Canada

Two ASV80000 VPSA Oxygen Plants at a Steel Mill — Maraba, Brazil

Two ASV39000 VPSA Oxygen Plants for ozone generation — Melbourne, Australia

Containerized Relocatable VPSA Oxygen Systems

AirSep also offers containerized VPSA plants up to 15,000 SCFH (395 Nm^3/hr). The VPSA plant is simple to install and easy to relocate if desired. Simply pour a concrete pad capable of sustaining static weight, position the major VPSA components and connect 3 phase electric power. There is no need for cooling water, or other utilities. These plants are truly designed to be “plug and play.”



Standardized Low Cost and High-Efficiency VPSA Oxygen Systems with Capacities up to 15,000 SCFH (395 Nm^3/hr)

AirSep Delivers Quality Products Around the Globe:

Cutting-Edge Engineering and Design

- AirSep engineers have extensive and diversified VPSA installation experience and optimize each system to customer’s specific requirements

Production

- The assembly of each plant guarantees quality down to the last detail

Cost Effective

- Automatic turndown cuts power costs dramatically versus conventional supplies
- Upgrades for older PSA generator models

Control Systems

- AirSep uses the most advanced touch-screen control technology available

Engineering Services

- AirSep offers fully integrated engineering services for VPSA systems and field installations

Feature Benefits to VPSA

AirSep VPSA Oxygen Systems are highly reliable, cost-effective, and offer remote monitoring. AirSep engineers assist with construction, startup, and offer maintenance training. Downloading the stored data is an option for performance evaluation. After the installation, ongoing engineering support is provided at no cost to the customer.

AirSep VPSA Oxygen Systems:

State of the Art Design

- Designed in accordance with local and international standards
- User-friendly systems
- Designed for various applications
- 25-year equipment life with minimal maintenance
- HMI real-time plant operation
- Generates oxygen at 93% oxygen concentration

Replace and Upgrade to a High-Efficiency AirSep VPSA Plant

- Continuous VPSA oxygen supply with low energy costs
- Automatic and unattended operation
- On-site start-up assistance by AirSep technicians anywhere in the world

Control Oxygen Costs

- Low cost AirSep standardized design with 2,100 or 3,200 SCFH also available
- Automatic turndown capability from 100% to 0% flow capacity resulting in real power savings

Remote Monitoring

- Remote monitoring of system operation by AirSep engineers
- Critical process parameters monitored and recorded every 250 milliseconds

Dramatically Reduce Oxygen Costs

- Regain control of oxygen generation
- Low cost on-site generation supply

Sample Specifications (Generally Available in 1,000 SCF Increments)

Model	Capacity	VPSA Building Dimensions
ASV2000	2,000 SCFH (53 Nm^3/hr)	32 x 24 x 20 ft (9.8 x 7.3 x 6.1 m)
ASV10000	10,000 SCFH (263 Nm^3/hr)	42 x 24 x 20 ft (12.8 x 7.3 x 6.1 m)
ASV20000	20,000 SCFH (526 Nm^3/hr)	58 x 33 x 25 ft (17.7 x 10.1 x 7.6 m)
ASV50000	50,000 SCFH (1,314 Nm^3/hr)	80 x 55 x 30 ft (24.4 x 16.8 x 9.1 m)
ASV120000	120,000 SCFH (3,155 Nm^3/hr)	90 x 60 x 30 ft (27.4 x 18.3 x 9.1 m)

AirSep VPSA Oxygen Systems with a capacity of 10,000 SCFH and larger, have a guaranteed power consumption of:
1.03 kWh ±5% per 100 SCFH of total flow, nominal 93% oxygen at 3 psig product pressure at maximum plant capacity at standard conditions.
.39 kWh ±5% per Nm^3 of total flow, nominal 93% oxygen at .21 barg product pressure at maximum plant capacity.
Standard conditions 1 atmosphere, 70ºF, 0% relative humidity.
Normal conditions 1 atmosphere, 0ºC, 0% relative humidity.

Note: Specifications subject to change without notice.

Excellence in design, manufacture with quality parts, and high-level workmanship are the hallmark of all AirSep VPSA oxygen systems.

True flexibility in custom engineering allows us to develop systems that utilize components that yield the desired capacities, **with the highest efficiency for each VPSA plant.**

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