



MENTIS ENGINEERING

On-site Oxygen (O₂) gas generation solutions

S-PSA-100-O2

Oxygen Generator Datasheet

MODEL

S-PSA 100

MODEL FLOW / MODEL PURITY

123.4 Nm³/hr @ %95

REVISION

ME-TK-2607

DATE

2026-07-02

S-PSA Oxygen Generators

S-PSA Oxygen Generators use Pressure Swing Adsorption technology to adsorb nitrogen and trace gases from compressed air on zeolite molecular sieve and deliver oxygen-enriched product gas.

How Do PSA Generators Work?

Air consists of approximately 21% oxygen, 78% nitrogen, 0.9% argon and trace gases. In PSA oxygen systems, zeolite molecular sieve selectively adsorbs nitrogen and directs oxygen-enriched product gas to the generator outlet.

Mentis's Unique S-PSA Technology

Mentis Engineering Serial-PSA technology improves the standard PSA architecture with a two-stage process. First, compressed air is treated for moisture, particles, oil vapour and unwanted components. Then, zeolite adsorption retains nitrogen and produces oxygen-enriched product gas.

Oxygen Gas Applications

Medical Oxygen

On-site oxygen generation infrastructure for hospitals, clinics and healthcare facilities.

Wastewater Treatment

Supporting dissolved oxygen levels in biological treatment processes.

Ozone Generation

Stable oxygen feed for ozone generator systems.

Aquaculture

Oxygenation for fish farms and aquaculture processes.

Glass & Metal

Oxygen enrichment for combustion efficiency, melting and process applications.

Gold Mining

Oxygen feed supporting oxidation efficiency in cyanide leaching processes.

Chemical Oxidation

Controlled oxygen supply for reactors and process lines.

Laboratory

Oxygen gas for analytical instruments and special process applications.

Cutting & Welding

Oxygen-assisted process gas use for metal cutting, welding and thermal processes.

Technical Summary

PSA + ZMS Technology

Zeolite molecular sieve selectively adsorbs nitrogen; oxygen-enriched gas is obtained on the product side.

Twin-Column Cycle

One column produces while the other regenerates; this cycle ensures continuous generation.

Integrated Air Treatment

Integrated drying and filtration provide stable feed air suitable for the PSA process.

Pressure Range

Standard generator outlet pressure can be configured between 1 - 7 bar(g).

Feed Air

ISO Class 1.4.1 compressed air quality and maximum +3°C dew point are required for stable performance.

Control & Monitoring

PLC/HMI, purity measurement, digital flowmeter, consumption graphs and Modbus / RTU enable process monitoring.





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Technical Specifications

Model	S-PSA-100-O2
Model purity	%95
Model flow	123.4 Nm ³ /hr
Oxygen Pressure	1.0 - 7.0 bar(g)
Air / O ₂ Ratio	10.000
Required Compressed Air	1,234.1 Nm ³ /hr
Oxygen Dew Point	-70 °C
Power options	110-240V AC 50/60 Hz 150 W
PLC / HMI	7"

Requirements

Required feed air pressure	6.0 - 11.0 bar(g)
Pressure drop	1.2 bar(g)
Minimum oxygen tank volume	6,500.0 L
Maximum Feed Air Dew Point	+3°C
Air Quality	ISO 8573-1 Class 1.4.1
Ambient Temperature Range	-5 / +50°C

Reference Conditions

Ambient pressure	1013 mBar
Ambient temperature	20°C
Compressed air inlet pressure	7.5 bar
Compressed air inlet quality	ISO 8573-1 Class 1.4.1

Advantages

Low Gas Generating Cost

On-site generation helps reduce cylinder, liquid tank, filling and logistics costs.

Plug & Play Single Skid Design

Integrated dryer, filtration, PLC/HMI, analyzer and flowmeter infrastructure provide a compact ready-to-install system architecture.

Product Gas Quality

Oxygen purity and process data can be continuously monitored, recorded and verified.

Easy Installation

Fast commissioning is supported with only suitable compressed air quality and electrical supply.

Heavy Duty Construction

Skid frame and durable process components are used for industrial site conditions.

Low dBA Levels

Exhaust silencing muffler and optimized valve venting are designed for low sound levels.

Low Energy Consumption

Properly selected S-PSA capacity and optimized air consumption support efficient operation.

Fully Automatic Unattended Operation

PLC-controlled operation, alarm management and automatic standby reduce operator intervention.

Highly Reliable

High cycle life valves, premium adsorbent media and industrial design provide stable production.

Low Maintenance

Simple process architecture, smart maintenance alarms and service infrastructure reduce maintenance effort.

No Hazardous Storage

On-site production reduces the need for high-volume cylinder or cryogenic storage.

Stable Pressure and Purity Control

PLC/HMI and analyzer infrastructure keep process pressure and oxygen purity continuously under control.

Oxygen Purity / Oxygen Flow Chart - S-PSA-100-O2

Oxygen flow

%90	148.0
%93	133.3
%95	123.4
%97	104.9
%99	83.9
%99.5	62.9

Compressed air requirement

%90	1,257.6
%93	1,226.2
%95	1,234.1
%97	1,174.9
%99	1,015.4
%99.5	786.8



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Mechanical and Dimensional Data

Adsorber diameter	958 mm
Adsorber body height	2,700 mm
Generator vessel volume	1,946.2 L
W x L x H (mm)	2250 x 1910 x 4375
Inlet connection	4"
Outlet connection	3"
Product gas outlet for selected purity	3"
DN size	DN80

PSA Adsorber Vessel Details

Adsorber diameter	958 mm
Dished-end thickness	8 mm
Adsorber body height	2,700 mm
Shell thickness	8 mm
Dished-end volume	139.0 L
Shell volume	1,881.7 L
Single-column total volume	2,159.7 L
Twin-column total volume	4,319.4 L
Molecular sieve quantity	2,721.2 kg
Adsorbent type / model	Zeolite Molecular Sieve: UOP Honeywell - PSA O2 XP

Integrated Desiccant Dryer Details

Dryer vessel volume	185.39 L x2 = 370.78 L
Total active alumina quantity	259.55 kg
Dryer body height	2,700 mm
Dryer maximum pipe size	5"
Dryer diameter	12" / 323.9 mm
Dryer inner pipe size	5"

Standard Features

- Continuous and stable oxygen generation with O₂ S-PSA technology.
- Two-stage Serial-PSA process architecture: pretreatment + oxygen enrichment cycle.
- Integrated self-desiccant air dryer system.
- Integrated 0.1 and 0.01 micron line filtration.
- Automatic stop / start / standby operation mode.
- Long-cycle-life pneumatic / electric actuated process valves.
- O₂ analyzer with calibration kit.
- Pressure safety valve and oxygen pressure regulator.
- PLC control system and 7" color touchscreen HMI.
- Integrated volumetric oxygen flow indication via digital flowmeter.
- 24/7 pressure, purity, consumption and trend recording infrastructure.
- Smart maintenance and service alarm system.
- LAN / Ethernet connection infrastructure.
- Carbon steel skid frame construction.
- Low purge noise with exhaust silencer muffler.
- High-performance zeolite adsorbent media filling.
- Stainless steel construction for valves and process connections.
- 2-year warranty; service and spare parts support.

Optional Features

- Dew point sensor.
- Inlet cyclone filter.
- Inlet activated carbon filter.
- Outlet sterile / bacteria filter.
- Oxygen buffer tank.
- Remote monitoring and control via Ethernet.
- Turnkey containerized or single-skid system.
- 650W UPS.

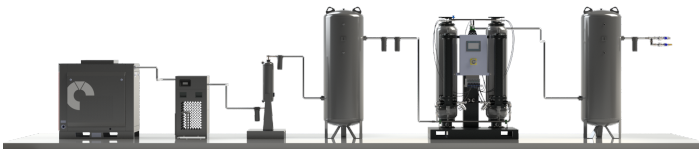


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Installation View

The installation image below represents the general process layout between compressor, dryer, filtration, air receiver, PSA generator and product gas receiver.



Standards Compliance

- CE Conformity
- PED 2014/68/EU - pressure equipment conformity
- EN ISO 12100 - machinery safety risk assessment
- EN 60204-1 - machine electrical safety
- ISO 8573-1 Class 1.4.1 - feed air quality
- ISO 13485:2016 - medical devices quality management system
- ISO 14971 - risk management for medical devices
- ISO 15001 - oxygen compatibility and cleanliness approach
- Optional: ASME, EAC and project/country-specific certifications

Air / O₂ Ratio by Oxygen Purity

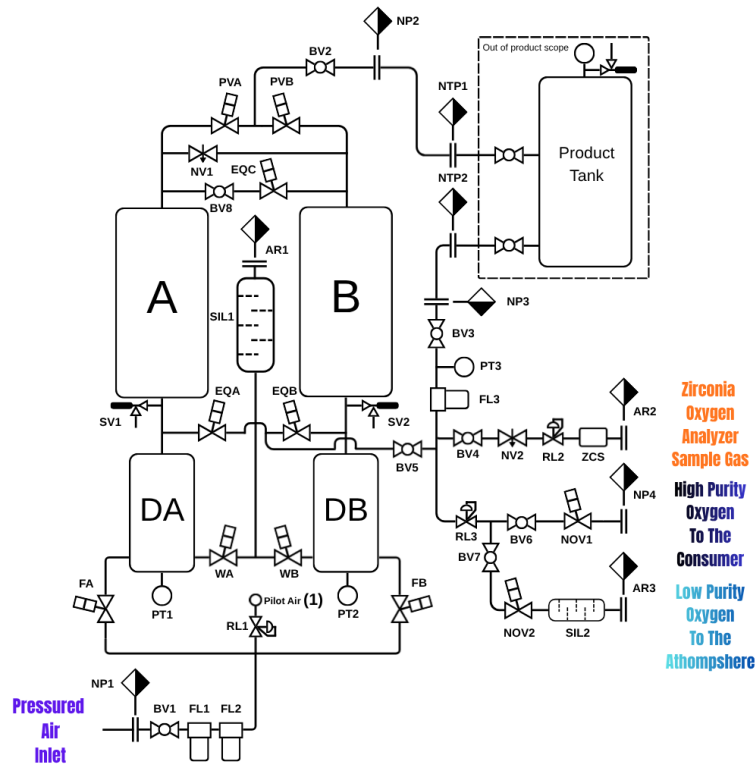
Oxygen Purity	Air / O ₂ Ratio
%90	8.50
%93	9.20
%95	10.00
%97	11.20
%99	12.10
%99.5	12.50

Automation and Mentis S-PSA Software

- Monitoring screen infrastructure for oxygen pressure, oxygen purity, instantaneous consumption flow and outlet dew point.
- Recording and analysis of pressure, purity, consumption and historical process data.
- 24/7 continuous purity measurement and alarm tracking.
- Instantaneous and total consumption monitoring via digital flowmeter.
- Consumption charts, trend analysis and historical data records.
- Smart scheduled maintenance alerts designed to reduce unforeseen service costs.
- HMI language interface options in English, Turkish, Russian, Arabic and Spanish.
- Modbus / RTU and LAN / Ethernet communication infrastructure.

P&ID Page

The reference process and instrumentation diagram for the selected product family is shown below.



Model

Model	S-PSA-100-O2
Model purity	%95
Model flow	123.4 Nm ³ /hr @ %95
Oxygen Pressure	1.0 - 7.0 bar(g)
Air Quality	ISO 8573-1 Class 1.4.1

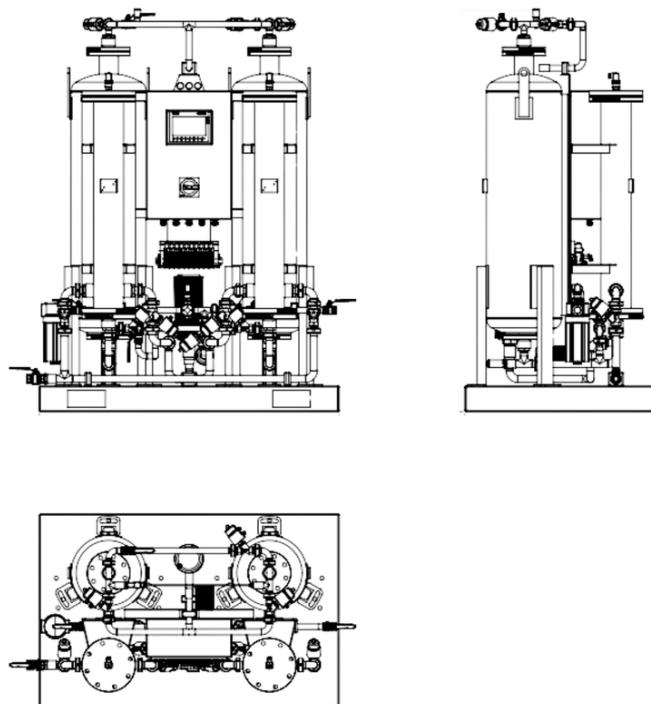


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General Arrangement and Dimension Drawing

The drawing below shows the common mechanical design reference for all generators. All dimensions are in mm.



Dimension and Connection Summary

Model	S-PSA-100-O2
W x L x H (mm)	2250 x 1910 x 4375 mm
Inlet connection diameter	4"
Outlet connection diameter	3"

The drawing is schematic for general arrangement purposes; final manufacturing dimensions shall be verified with the approved project drawing. Drawings may vary by +/- 5% depending on the project.

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Mentis Engineering Contact Information

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