



MEDICAL PSA OXYGEN GENERATOR

- Low Energy Consumption
- Long Life
- Smart Algorithm



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About us

Sümer A.Ş. was established in 1981 in Ankara to provide services in the medical device sector. It has aimed advancement since the day of its establishment by also taking growth and compliance with the contemporary technologies and protecting the environmental conditions. Our manufacturing takes place in an area of 25.000 m2 in Ankara Organized Industrial Zone.

Our Firm is following the innovations in its sector and in abroad through its research and development unit and its application staff with a strong infrastructure of engineers, and is continuing to produce devices it had developed in computer environment based on such innovations with high technology and to contribute their development so as to be most beneficial for the Turkish medicine.

With this purpose, our Firm is strictly following the "Quality Management" principles and rules from design of the products to the after-sale servicing.

Our Firm has been currently certificated for compliance with ISO 9001 quality management system, ISO 13485 medical device quality management system certificate and ISO 14001 environment management system certificate and with product certificates under MDD 93/42/EEC Medical Devices Directive and PED 2014/68/EU Pressurized Equipment certificate. Furthermore, our steam sterilizers, and disinfection and washing devices have been certificated by the German accredited body.

Our Firm possesses the following certificates;
CE Certificates under the following directives:
ISO 9001,
ISO 13485,
ISO 14001 Quality Management System,
MDD 93/42/EEC Medical Devices,
PED 2014/68/EU Pressurized Equipment

Our Vision

To make the Sümer brand a global brand to make our Firm remembered first in the sector.

Our Mission

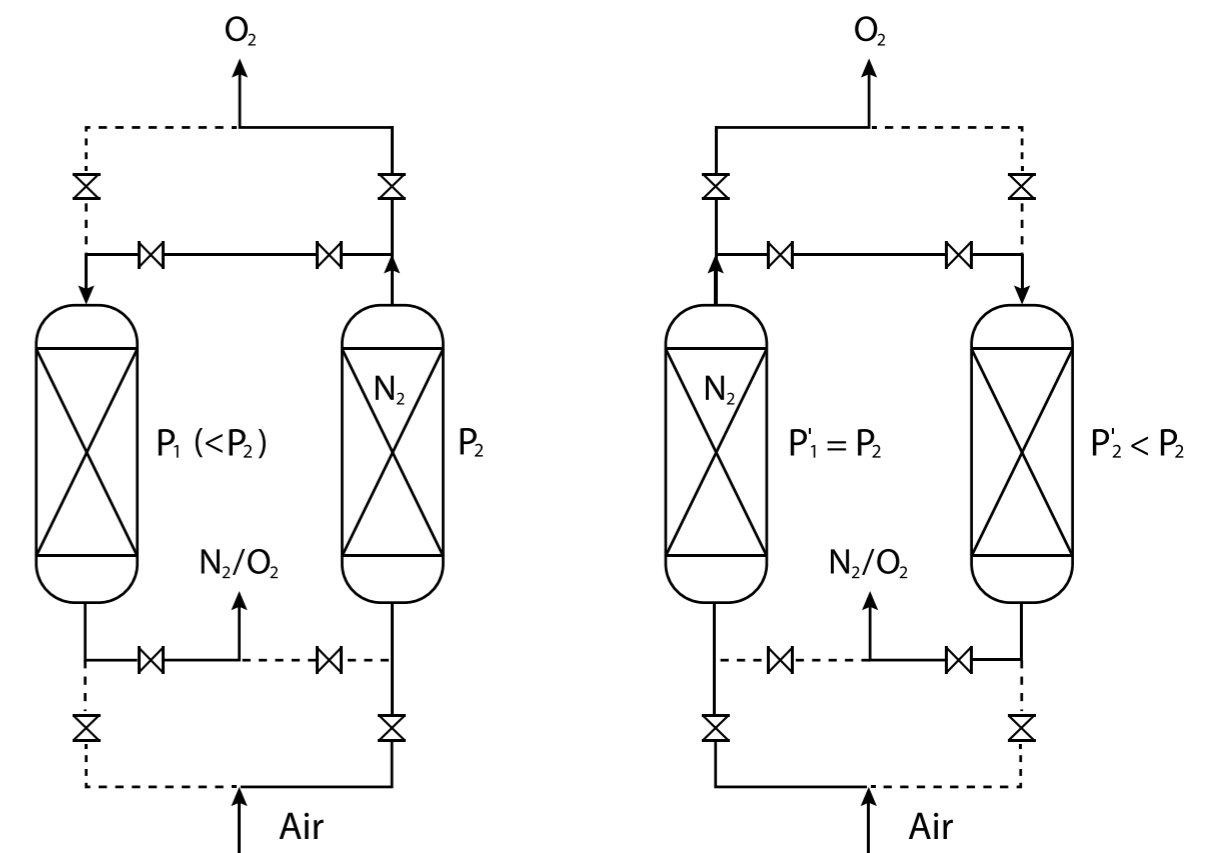
Our main task is to create designs with competition power in the global sense by taking the priorities of the sector into consideration and being respectful to the environment and people and giving the first priority to the wishes and expectations of customers, and also to produce innovative technological medical products by meeting all the national and international legal requirements.

Pressure Swing Adsorption Technology

Pressure Swing Adsorption (PSA) technology is used with specially developed adsorbents called zeolites to separate oxygen from nitrogen to be able to use pure oxygen in many applications.

First, air is compressed up to 10 bars with the help of compressors, then air is dried out to remove the moisture in the air. Filtration takes place thereafter to filter out the remaining particles, aerosol and oil which is in the pressurized air stream. Carbon Tower ensures long term oil free oxygen delivery.

PSA unit consists two tanks filled with zeolites. Each column undergoes cyclic sequence of pressurization, generation, equalization and exhaust cycles for continuous flow of high purity oxygen.



PSA Advantages

- Reduction of oxygen cost
- Safe low-pressure oxygen usage instead of explosive high-pressure cryogenic cylinders
- Elimination of logistical and administrative operations
- Elimination of orders and deliveries
- Ready to use high technology solutions

Our products are designed for producing 93±3% purity medical oxygen gas from air. Our devices are used in:

- Hospitals,
- Polyclinics,
- Rehabilitation centers.

Oxygen Generators should be used by technical staff who have successfully finished their training.



General Specification

| | |
|-------------------------------|---|
| Product | 93±3 Medical Oxygen Gas |
| Zeolite Type | High Efficiency Molecular Sieve 13X / Made in USA |
| Control Modes | SMART, 90%, 93%, 95% |
| Control System | Electronic Card |
| Use | Fully Automatic / Touch Screen |
| Screen Type | Color TFT, Touchscreen LCD |
| Real Time Operation Animation | Yes |
| Screen Dimensions | 10.1" |
| Keypad | Touchscreen |
| Communication | MicroSD and Ethernet |
| Warning System | Visual, Audible, SD Card and Ethernet |
| Data Recording | At least 1 Year |
| Real Time Monitoring | Touchscreen and Remote Desktop |
| Security | 1 Operator, 1 Service |
| Service Maintenance Reminder | Yes |
| Language | English, French, Arabic, Turkish (other languages are available upon request) |
| Sensors | 4 x Pressure, 1 x Temperature, 1 x Humidity, 1 x Oxygen 1 x Flowmeter, 1 x CO (optional), 1 x CO2 (optional) |
| Filters | 5 µm, 1 µm, 0.01 µm, Carbon Filter, Sterile Filter, Dust Filter |



| Related Directives and Standards | |
|--|--|
| Medical Device Directive | MDD 93/42/EEC |
| Medical Device Class | Class 2b, acc. to EC MDD 93/42/EEC |
| Low Voltage Directives | EN 60601-1 |
| Electromagnetic Compatibility Directives | EN 60601-1-2 |
| Quality Management System Requirements | ISO 9001 |
| Medical Devices Regulatory Requirements | ISO 13485 |
| Environment Management System | ISO 14001 |
| Electrical Connection | 110-220V ±10% - 50-60Hz 220-440V ±10% - 50-60Hz |

| Working Conditions | |
|-------------------------|-------------|
| Operating Temperature | 5 °C- 40 °C |
| Max. Operating Pressure | 10 bar(g) |
| Test Pressure | 15 bar(g) |

| Safety and Quality | |
|--------------------------------------|--|
| Protection against current leaks | |
| Short circuit protection | |
| Password protection | |
| Emergency stop button | |
| Over pressure protection | |
| Low oxygen tank pressure warning | |
| Low oxygen purity warning | |
| UPS support for electricity failures | |

| European Pharmacopoeia Requirements for Medical Oxygen 93 | |
|---|-------------|
| O2 | 93 ± 3 |
| CO2 | < 300 ppm |
| CO | < 5 ppm |
| NOx | < 2 ppm |
| SO2 | < 1 ppm |
| Oil | < 0.1 mg/m3 |
| Water | < 67 ppm |

Key Features of Oxyfresh

- Medical Oxygen from 93% to 95% (93±3%)
- Fully Automatic 24/7
- Real time trends of process parameters
- Visual recommended service maintenance reminders
- Algorithm against electricity cuts-off (Purity does not drop after electricity cuts-off)
- Smart Algorithm (Generator automatically adjusts its purity regarding oxygen flow)
- Highest packing density of zeolites (specifically designed filling station)
- Uniform flow distribution design to maximize zeolite life
- Specifically designed Starting and Stopping points to protect purity from dropping
- Humid protection system (Humid air cannot enter the zeolite tanks)
- Medical Grade Oxygen Filtration
- High Efficiency Molecular Sieve+
- Real Time Monitoring
- Remotely Manageable via Ethernet
- Recording Capabilities and Data Logging
- Multi-level secured access for supervisory control
- Top quality SMC valves and flow meter
- Medical Device CE
- 10.1-inch-Wide Touch Panel
- User Friendly Interface
- Multi language



Possible System Configuration

- According to ISO 7396-1:2016 Medical Gas Pipeline Systems Standard, the oxygen supply system should have 3 sources of supply which are; Primary, Secondary and Reserve.
- Configuration 1. 1 PSA System + 2 External Source such as cylinders
- Configuration 2. 2 PSA System + 1 External Source such as cylinders
- Configuration 3. 2 PSA System + 1 High Pressure Emergency back-up system

Performance of Oxfresh Medical PSA Oxygen Generator

| MODELS | 93% | | Air Cons. | | 95% | | Air Cons. | |
|---------------|-------|--------|-----------|-------|-------|--------|-----------|-------|
| | Nm3/h | NL/min | SCFH | Nm3/h | Nm3/h | NL/min | SCFH | Nm3/h |
| OXYFRESH-30 | 1.8 | 30 | 64 | 20 | 1.6 | 27 | 57 | 20 |
| OXYFRESH-50 | 3.0 | 50 | 106 | 34 | 2.7 | 45 | 95 | 34 |
| OXYFRESH-70 | 4.2 | 70 | 148 | 46 | 3.7 | 62 | 131 | 46 |
| OXYFRESH-100 | 6.0 | 100 | 212 | 66 | 5.3 | 88 | 187 | 66 |
| OXYFRESH-150 | 9.0 | 150 | 318 | 99 | 7.9 | 132 | 279 | 99 |
| OXYFRESH-200 | 12 | 200 | 424 | 126 | 10.5 | 175 | 371 | 126 |
| OXYFRESH-250 | 15 | 250 | 530 | 162 | 13.6 | 227 | 480 | 162 |
| OXYFRESH-300 | 18 | 300 | 636 | 192 | 15.9 | 265 | 562 | 192 |
| OXYFRESH-400 | 24 | 400 | 848 | 286 | 21.0 | 350 | 742 | 286 |
| OXYFRESH-500 | 30 | 500 | 1060 | 350 | 26.0 | 433 | 918 | 350 |
| OXYFRESH-600 | 36 | 600 | 1271 | 425 | 32.1 | 535 | 1134 | 425 |
| OXYFRESH-750 | 45 | 750 | 1589 | 519 | 40.1 | 668 | 1416 | 519 |
| OXYFRESH-1000 | 60 | 1000 | 2119 | 668 | 52.0 | 867 | 1836 | 668 |
| OXYFRESH-1250 | 75 | 1250 | 2649 | 870 | 65 | 1083 | 2295 | 870 |
| OXYFRESH-1500 | 90 | 1500 | 3178 | 954 | 77 | 1283 | 2719 | 954 |
| OXYFRESH-1800 | 108 | 1800 | 3814 | 1260 | 96 | 1600 | 3390 | 1260 |
| OXYFRESH-2400 | 144 | 2400 | 5085 | 1512 | 124 | 2067 | 4379 | 1512 |

Performance at 20 °C and 1 bar atmospheric conditions.

Required inlet compressed air quality is 1:4:1 according to ISO 8573-1.

Purity and Capacity values may slightly change during the life time of the generator.

Purity and Capacity values may slightly change depending on the atmospheric conditions.





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