



OXAIR®

CENTRALES GENERADORAS DE OXIGENO

Distributor



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OXAIR®



OXAIR, Ltd. is a North American manufacturer and worldwide distributor of high purity oxygen delivery systems, cylinder filling plants, and oxygen generators for medical, industrial, and military applications.



Providing PSA Oxygen Systems Solutions Worldwide for Today's Diverse Demand



Since 1988, Oxair, Ltd. has been involved with the design, engineering, consultation and manufacturing of oxygen (USP 93-99% purity) generating systems, utilizing Pressure Swing Adsorption (PSA) as an air separation process.

Since 2005, OXAIR has delivered several containerized systems to Iraqi medical facilities operating in several cities.

Oxair's line of oxygen cylinder filling plants range from as little as two cylinders per day to hundreds. The company has become a supplier of field deployable oxygen cylinder filling plants and supplies to the Spanish NATO contingent operating in Afghanistan and other crises areas.

In addition to the PSA Oxygen Systems, OXAIR also offers VPSA Oxygen Systems for lower power consumption, and these systems are engineered to the specific application.

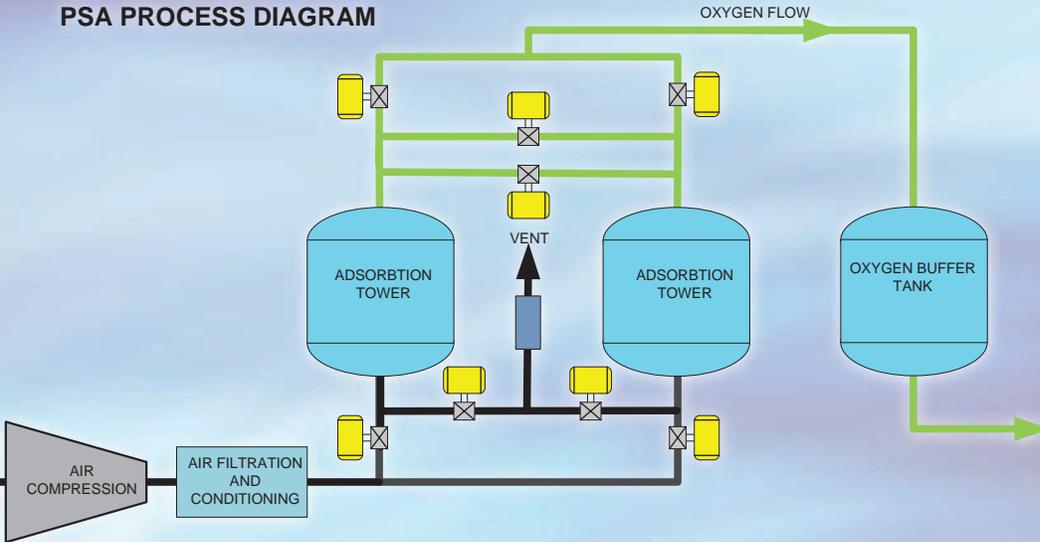
Oxair serves a wide range of industries: aerospace, food and beverages, healthcare, glass industry, gold mining, chemicals, refining, ore and gas production, primary metals and metal fabrication, as well as other areas of general industry.

Oxair, Ltd. has placed several systems in operation around the world. OXAIR can custom design and build any system to meet the specific requirements of our customers.

Oxair, Ltd. provides extensive pre- and post-sale training, service and support, as well as high-quality assembly services.

Learn more about our products, visit us at www.oxair.com

PSA PROCESS DIAGRAM



What is PSA? (Pressure Swing Adsorption)

PSA is an economical alternative for on-site production of oxygen or nitrogen (and other gases) for medical and industrial purposes.

Along this process, ambient air is compressed, conditioned, and filtered through synthetic minerals (zeolites) under pressure, where nitrogen is selectively adsorbed while oxygen and argon are not, and pass through the zeolites stored in a buffer tank to be used directly by the end user on demand.

Ambient air fed into the compressors is 78% nitrogen, 21% oxygen, 1% argon and other gases. As nitrogen is separated, the resulting gas is up to 95.5% oxygen purity. This maximum purity is the theoretical maximum; as nitrogen is adsorbed, the remaining gas can only contain the remaining 1% argon and other trace gases and 21% oxygen, therefore,

the limiting concentration of the impurities will be 1/21 or 4.5% maximum. This leaves the ultimate maximum oxygen purity at 95.5%. Actual concentration of the gases varies slightly, so the above is an approximation to within 1/2%.

This process is based on the fact that different gases have the propensity to be attracted to different solid surfaces more or less strongly. This happens with the nitrogen, which is attracted to the zeolites. As the air is compressed, the nitrogen is forced into the crystalline cages of the zeolite, and the oxygen and nitrogen is less adsorbed and conveyed to the end of the zeolite bed and ultimately recovered in the oxygen buffer tank.

Two zeolite beds are used together: One filters air under pressure until it gets saturated with nitrogen while oxygen passes through. The second filter begins to do the same while the first one is regenerated as



nitrogen is expelled (desorbed) by releasing the pressure. The process begins again, storing the oxygen and argon in a tank.

The argon could be separated afterwards increasing the amount of oxygen up to 99%. Using a carbon molecular sieve (CMS) based adsorbent, which absorbs the oxygen, allowing the impurities to be scrubbed.

The maximum purity achievable in such systems is 99.3%. Typically the system is operated at a design point of 99.1% to optimize the output. In such a system there is about a 35% loss in the 94% feed product gas. This loss of product is sensitive to the purity level: lower purity, less product loss.

PSA process differs from cryogenic techniques of gas separation as it can function under near-ambient temperatures.

The most comprehensive range available from any manufacturer in the world.

Oxair provides the industry's most comprehensive range of PSA / VPSA oxygen generators, easy-to-use, safe and reliable solutions designed specifically for your application.

We are flexible enough to meet the needs of thousands of customers in a diverse range of industries. Configured to your environment and workflow, our results-driven solutions empower you to reduce costs and enhance productivity.

From 95 to 99% oxygen purity, Oxair makes it easy to choose the right system for your application.

All products designed and manufactured to the following standards: USP 93%, CE 93/42/CEE, A.N.M.A.T., and ISO 9002 Compliance.

Our Products



Oxygen Generation Equipment

Oxair has been developing PSA Oxygen Generators for over 20 years, supplying oxygen generators worldwide for a variety of applications.

These high-quality standard oxygen generators provide dependable and efficient operation for your application delivering up to 95% pure oxygen.



Cylinder Filling Systems

Oxair provides a comprehensive range of Cylinder Filling Systems that are a safe and reliable source of on-site production for your operation.

Filling capacities from 2 to 200 cylinders per day are typical. They are available in standard purity and high purity configurations.



Medical Systems

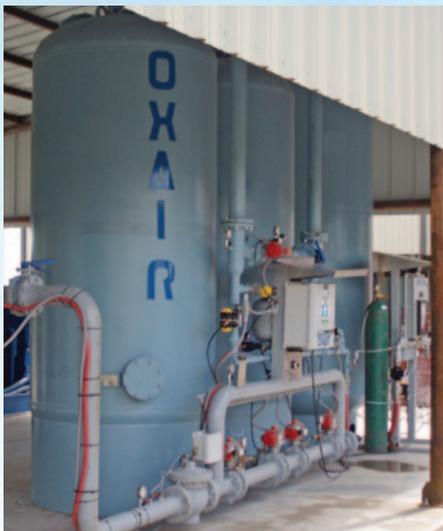
Medical Oxygen Concentrators, OXYMED® and DCOMS® Systems provide medical grade oxygen systems.

- Fully automated systems
- Turn key operation
- Containerized or skidded stand alone versions available

The Proven Oxygen Enrichment System Solution

Applications and Uses

- Hospital installation, small clinics, and ambulance applications
- Ideal for environmental, pulp and paper, waste water treatment, mining and municipal industrial
- Cylinder filling, welding, brazing, and battery manufacturing
- Simple, easy, and flexible answer to your oxygen application
- Industry tested for more than 20 years with 1,000+ global installations
- 90-99% oxygen purity
- Cost-effective on-site oxygen production alternative
- Reduce operating costs
- Reduce energy consumption
- Pre-engineered and outfitted



Large Industrial Plants

PSA or (VPSA) Vacuum Pressure Swing Adsorption Systems provide a reliable oxygen supply source with low capital and operating costs.

These custom-engineered systems can offer purities to 93% with capacities from 3,000 to 50,000 SCFH.



Nitrogen Generation Equipment

Besides oxygen generation equipment, Oxair can now offer Nitrogen Generators with standard purities of 99.5% as well as more specialized ones with purities of 99.999%. Standard capacities can vary from 20 scfh to 10,000 scfh.



Oxygen Compressors

Our uniquely engineered medium and high pressure oxygen compressors provide the means to reduce dependency on other more expensive ones.

OXC-Series are available with flows up to 50 m³/hr at pressure up to 15 bar(g) for the medium pressure compressor.

LPC-Series High pressure Hydraulic compressors with flows of 30 m³/hr with pressures up to 200 bar(g).



OX-26 1000 scfh (~26 m³/hr) at 93%



OP-2 PSA Oxygen Purifier 80 scfh (~2 m³/hr) at 99.2%

OXYGEN GENERATORS

OX-Series

These oxygen generators produce oxygen with a maximum purity of 95%. Typically they are designed to operate at 93 to 95% purity.

They consist of two molecular sieve towers and valving arrangement. Optional oxygen buffer tank.

Capacities range from 2 Nm³ to 75 Nm³.

They are available with PLC control for valve timing, as well as touch screen display.

An oxygen monitor is standard to provide a visual and acoustic signal warning at less than 90% purity. Zirconia type oxygen analyzer is also available as an option.

OXYGEN PURIFIERS

OP-Series

With the addition of our second stage purifiers, we can increase the purity of any existing system to 99% plus, provided that the present PSA will yield at least 92% at a pressure of 60 psig.

They are available up to 50 m³/hr and will require at least 100 ft³ of 92% feed gas to produce 65 ft³ at 99%. Therefore, a 35 to 40% loss in primary product can be expected in order to achieve the higher purity.

Output pressure from the purifier can be up to 15 bar(g), with 7 bar(g) as standard. Oxygen costs are in the order of 3 to 4 kw per Nm³ depending on the model.

Oxair offers its **CYLOX® Series** as a cylinder filling plant utilizes a Pressure Swing Adsorption (PSA) air separation process to produce up to 95% pure oxygen.



Skidded CYLOX® Cylinder Filling Systems

CYLINDER FILLING SYSTEMS

CYLOX-HP® Series available with purities up to 99.2% with second stage purification module OP-Series. They can fill cylinders either at 95% or at 99% purity with reduced filling capacity usually in the order of 35 to 40%. Filling energy costs can be 25 to 30 kw-hr per cylinder at 150 bar(g).

All CYLOX designs are delivered with these features:

- Flexibility and custom design
- Microprocessor control
- Easy to service and maintain
- Easy access and installation
- 15 to 20 kw-hr energy costs to fill a cylinder
- Maintenance costs at 50 to 70 cents per cylinder at 150 bar(g)
- Available with oil free oxygen compressor or with hydraulic type LPC-series compressor



Skidded CYLOX-HP®, High Purity (99%), Cylinder Filling System



Hospital Installation



OXL-Series Model OXL-40
40 Liter/min. at 6 bar(g) 93%



MEDICAL SYSTEMS

Oxair's Medical Systems allows on-site production of medical grade oxygen with a purity that conforms to the USP93 Pharmacopeia and the European standards.

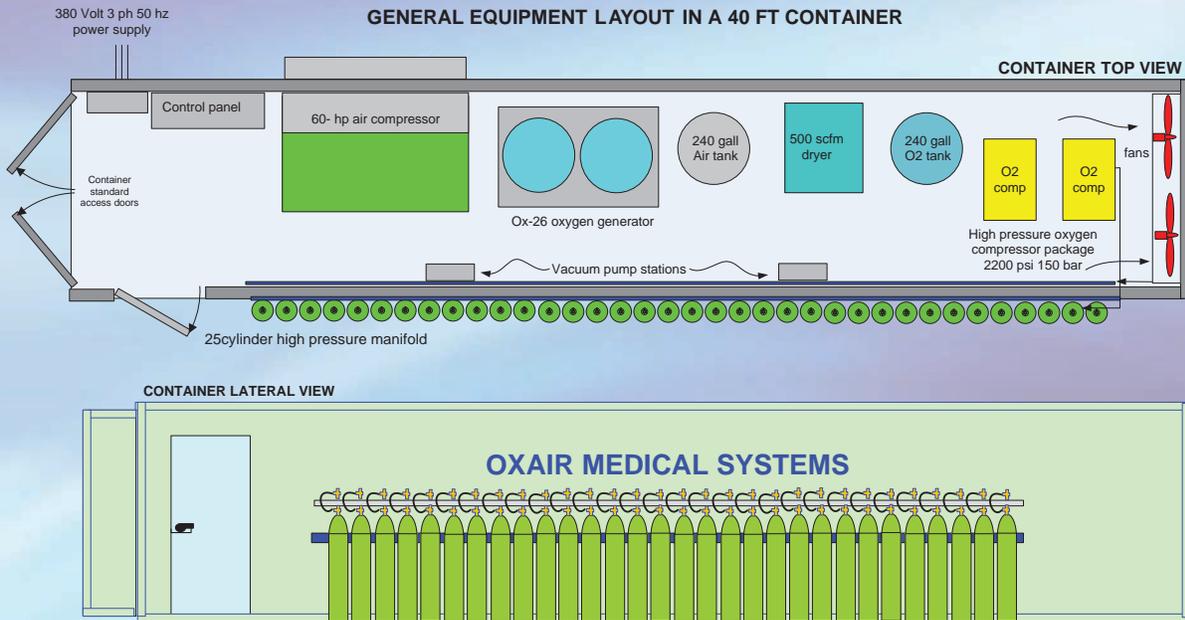
In addition to our standard OXM Series, where all the components are installed as discrete components, Oxair can custom build a system to fit your space limitations.

OXL Series are suitable for small clinics consisting of feed air compressor, oxygen concentrator and integral oxygen booster for up to 7 bar(g) oxygen delivery pressure. They are available in three capacities— 20, 40 and 60 Liter/min.

OXYMED Systems are supplied skid mounted or containerized. These systems can be equipped with a high pressure oxygen compressor with cylinder filling ramp. Consult factory for other options.



Skidded Medical Oxygen
Concentrator



CYLOX-100M

Complete Cylinder
Charging Station
Containerized
Forfield Drop Operation
Power- 70kw
Voltage: 380/3 PH/50 HZ



DCOMS - DEPLOYABLE CONTAINERIZED OXYGEN MEDICAL SYSTEMS

DCOMS

Turn-key systems designed to be deployable or installed in a medical facility area.

Containerized versions available in 10, 20 or 40 ft. ISO container depending on capacity for up to 100 cylinders/day.

- Purity 93% USP or 99%
- Back-up supply system
- Medical air also available as an option



Containerized DCOMS® Medical System in ISO 3000 Container Containing CYLOX 8-HP high purity system



MINING INDUSTRY
Oxair ASU 4 ton per day plant for Gold Leaching.

CHEMICAL AND PETROCHEMICAL
Oxair ASU supplies oxygen for the production of Polyvinyl Chloride (PVC) resin, the third most used plastic in the world.

LARGE INDUSTRIAL PLANTS

Oxair's large industrial plants are engineered to deliver standard sizes, as well as turn-key customized VPSA Systems for a highly reliable on-site oxygen source with low capital and operating costs.

Oxair **OXT-Series** ranges from 3,000 to 20,000 SCFH of oxygen per day.

Oxair **VPSA Systems** offer the most economical on-site source of process oxygen on the market today. The VPSA Systems are capable of producing high purity oxygen at the lowest possible cost. The use of a rotary-lobe air blower minimizes the power consumption, plus the proprietary Vacuum Pressure Swing Adsorption (VPSA) design reduces the operating cost.

ECONOMICAL – Generate oxygen on-site at half of the cost of liquid oxygen.

RELIABLE – Operate automatically with PLC pressure timing system

FLEXIBLE – Ranges from 5 to 50 tons per day (TPD)

- Delivery pressures from 2.5 to 150 psig
- Purities from 90 to 94%



Oxair ASU 6 ton per day plant prior to shipment



LIQUID PISTON COMPRESSOR, LPC-100
with filling capacity of 100 cylinders/day
at 150 bar(g)

ENVIRONMENTAL
OXC-50 at 100 psig. System for ground
remediation operating at NASA's former
launch facilities at Cape Canaveral, Florida.



NOX-8 cylinder filling station for 8 cylinder/
day at 99.5%

OXYGEN COMPRESSORS

NITROGEN GENERATION EQUIPMENT

When choosing an oil-free oxygen compressor, reliability is a major part of compressing oxygen and, of course, your facility's operating costs.

Our OXC Series are designed to operate at 200 to 300 rpm delivering flow rates of up to 50m³/hr at up to 15 bar(g).

LPC Series allows you to minimize operational expenses. Best of all most parts are readily available to minimize downtime.

Our comprehensive approach to oxygen recompression can minimize operational expenses and costly maintenance to your cylinder filling system.

- 100% Oil free oxygen
- Severe duty
- Reliable
- Low-cost maintenance
- Easy to service

The LPC Series high pressure oxygen compressor uses a novel approach in the compression of oxygen for cylinder filling.

Rather than a dry compression, a wet compression is achieved by using an industrial grade hydraulic water pump capable of generating water pressures up to 200 bar(g). A pair of alternating stainless steel vessels replaces the standard piston cylinder arrangement where a column of rising water compresses the oxygen to the final pressure.

Discharge temperatures are kept low, almost at ambient temperature, as a cooling system provides a dewpoint of 10°C.

Nitrogen purity from 95.5% to 99.9% is available with our standard line of Nitrogen generators.

For higher purities, we provide a custom-built approach for every project.

PSA Nitrogen Supply is Ideal for These Applications:

- Inerting Blanketing
- Heat Treating
- Packaging
- Control Atmospheres



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