Medical Oxygen

Worldwide Manufacturer of PSA Generators

Oxymat at a Glance

Oxymat is a Danish based company specialized in designing and manufacturing on-site Oxygen and Nitrogen solutions, using Pressure Swing Adsorption (PSA) Technology.

We have been designing, engineering and manufacturing Oxygen generator systems since 1978 and nitrogen systems since 2001. We posses first hand knowledge of the market, developments demands and possibilities the PSA technology holds.

It is our mission to be your preferred innovative, dynamic and environmentally responsible supplier of on-site oxygen and nitrogen solutions worldwide.

Our team of more than 60 skilled and dedicated employees, based in 3 different locations:

- Denmark: Administration, R&D and Sales
- Slovakia: Administration, Production, Project management and Sales
- China: Administration and Sales

With more than 20 engineers (project managers, 3D CAD designers, automation engineers and experienced sales engineers) making sure we offer the right solution for any demand.

Through an ever ongoing process we are always focused on developing Oxymat to be cost-effective and ahead of the competition in terms of quality, performance and price. This strategy has made it possible to grow to the size and position Oxymat has in the market today. Our 2010 turnover was 11 mil. € and our product range is the most energy efficient in the market and even at a competitive price.

Our team of specialists will always be able to serve any demand. From our extensive standard industrial or marine programme to highly specialized turnkey projects, Oxymat will provide the quality solution. We offer a wide range of standardized control systems, and remote access and can offer to taylor made automation solutions according to your requirement.

It is our priority to always deliver high quality products and services. Oxymat holds all relevant approvals for serving the numerous applications we supply.

ISO 9001:2008
ISO 13485:2004
ISO 14001:2004/2007
PED 97/23/EC Module B+D
MDD 97/42/EC (Medical Device Directive)
MARINE Class societies - we can deliver according to the rules of:

- American Bureau of shipping
- Bureau Veritas
- Det Norske Veritas
- Germanischer Lloyd
- Lloyd's Register
- Nippon Kaiji Kyokai
- RINA

Oxymat Medical Oxygen System:
The wise choice – the safe source!

The global demand for Oxygen generators in the medical field is growing rapidly and to us, this is a great challenge!

We can provide the state-of-the-art Oxygen supply you need meet your day-to-day requirements and demands.

An Oxymat Medical Oxygen System is the wise and safe choice when choosing your oxygen supply. In close corporation with our increasing number of medical customers, we have designed and developed a product line specifically for the medical application.

We offer a modular design, which is easily installed with any existing oxygen supply, it be cylinders, cryogenic or other PSA systems. Our highly advanced central control system carefully operates the system making sure your desired oxygen quantity and quality is supplied always.

Further features include:
Salient features:

- Full independency
- Full automation
- 24/7 – 365 days operation
- Full compliance with European Pharmacopoeia and ISO 10083
- Full compliance with MDD (Medical Device Directive), PED (Pressure Equipment Directive) and CE medical certification

Our extensive standard product range includes models supplying from 0,6 to 322 m^3/h.

Salient features:

- Low energy consumption (1,0 kW/m^3)
- Low CO_2 emission
- Heavy duty construction designed for rough conditions
- High quality & durable components
- Container installed systems
- Frame-built design
- Trouble-free installation
- High quality Touch Screen Control Unit
- Remote Control Access

Furthermore, our highly advanced three-column PSA system provides up to 1000 m^3 and 10 bar outlet pressure in one single production stage!

Bringing Oxygen Generators to Your Medical Care

European Pharmacopoeia, edition 7th, 2011

"Oxygen definition: 90 – 96 % concentration in volume. The reminder mainly is consisting of argon and nitrogen."

Oxymat Medical Oxygen Generating Systems are designed to thoroughly meet this requirement even before this definition came in force in April 2011.

Our customers are talking

Hospitals

„After installing a PSA generator on site in 2005, Hospital Samaritana, Bogota reduced their average monthly cost on liquid oxygen supply by 50%."

Christian Hansen
Project Manager, Chaher Ltda.

Veterinary Clinics

„Oxymat oxygen generator saves time and money, but most importantly it makes our hospital independent of suppliers and it helps protecting our environment."

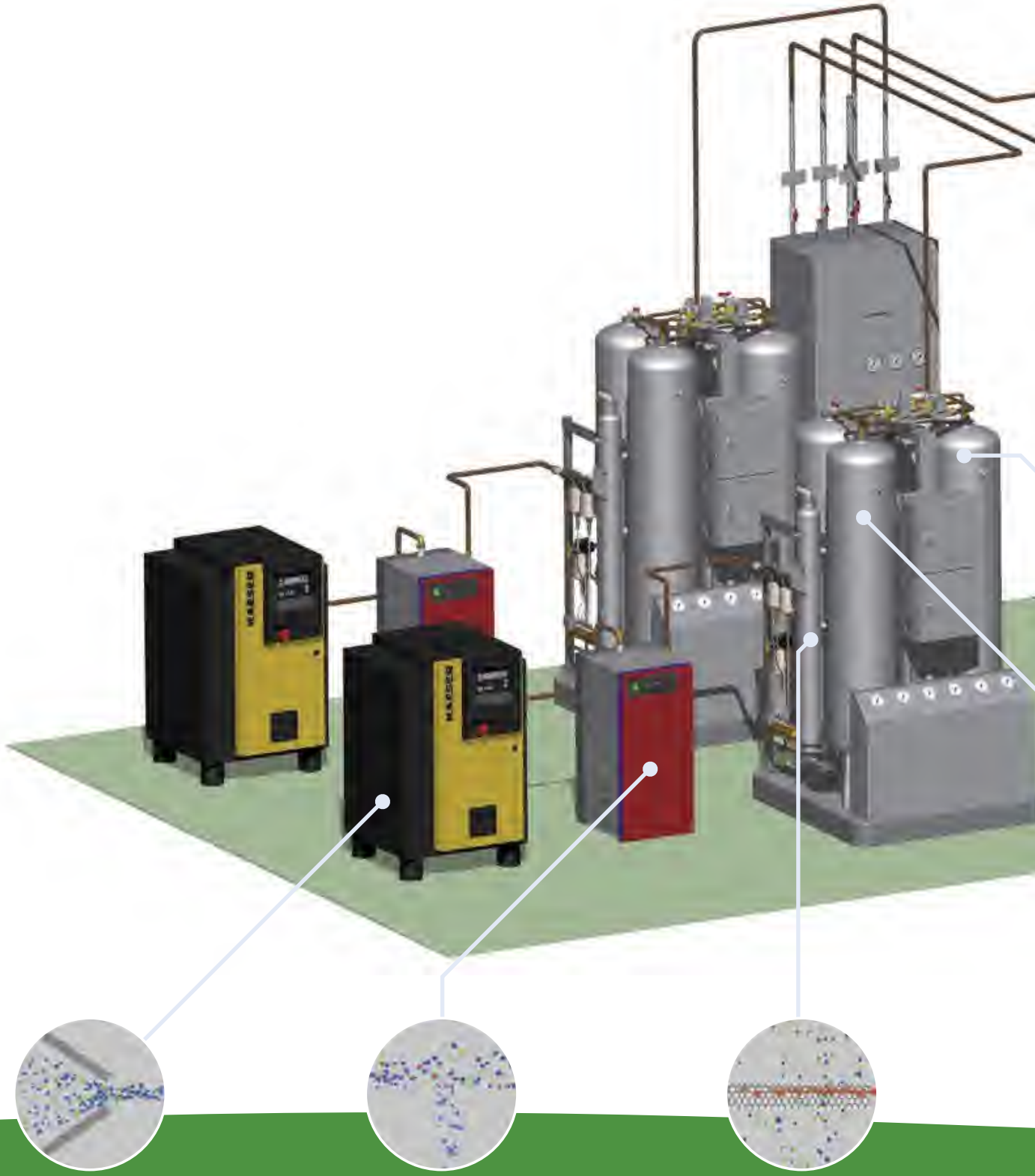
Prof. dr. Janoš Butinar, dr. vet. med
Animal Hospital Postojna, Slovenia

Hyperbaric chambers

„We have invested into oxygen generator to cut cost of oxygen. We have used gas cylinders with monthly spending around 2500 EUR, where 70% went only to services like transportation, handling and bottle rental. A part from that 20% VAT is another cost for us. The investment paid of in 6 months time. The generator is working well, so as service from Oxymat was good."

Giovanni Elia, O.T.I.P.
Instituto di Medicina Iperbarica

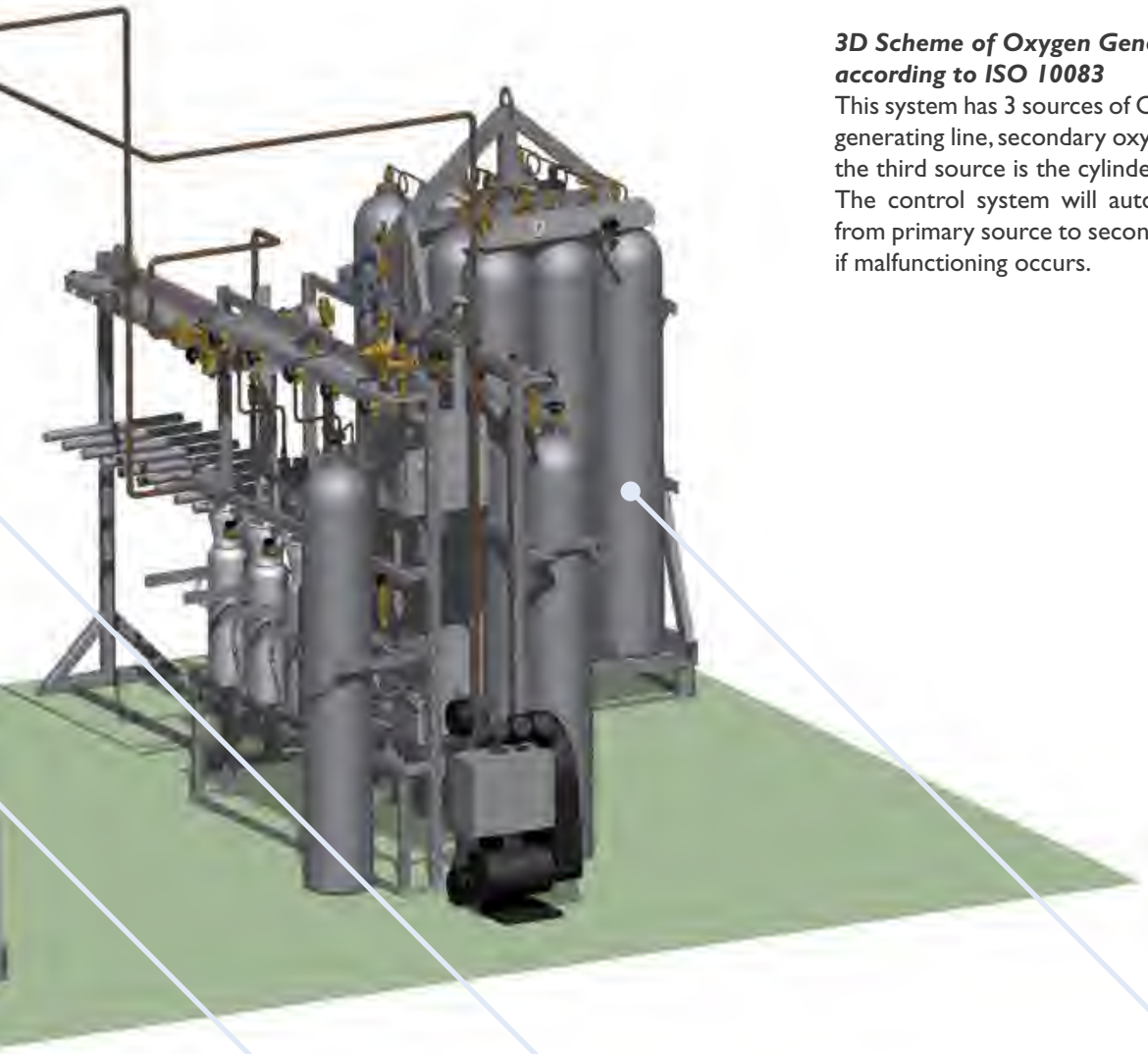
Concept



Compressor
increases air to required level of pressure

Dryer
removes moisture from air (air humidity) by cooling

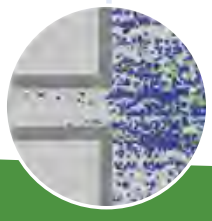
Coal tower
adsorbs harmful organic impurities such as oil vapours and hydrocarbon compounds



3D Scheme of Oxygen Generating System according to ISO 10083

This system has 3 sources of Oxygen: primary oxygen generating line, secondary oxygen generating line and the third source is the cylinder backup.

The control system will automatically change over from primary source to secondary or reserve source if malfunctioning occurs.



Air tank
accumulates necessary volume of air for PSA generator

Zeolite
filling with it`s ion-exchange beds traps nitrogen molecules and allows oxygen molecules to stream through

High Purity Oxygen
flows from PSA generator to product tank and is ready for use

Technical Features

Frame-built Generator Module

- Small footprint and high energy efficiency.
- Main components: inlet air filtration, air tank, oxygen generator, oxygen purity analyzer, product tank and gas filtration.

- All connections are located on the back of the unit ensuring trouble free installation .
- Connections: compressed air inlet, condensed drain water out, exhaust outlet through a silencer and oxygen outlet.

- The compressed inlet air is treated before entering the oxygen generator:
  Two filters eliminate particles down to 0,01 micron and a high-capacity active carbon filter removes oil vapours from the air.
  Also the produced gas is let through a carbon filter before en-tering the process.

- Front cover for easy manually supervision of unit pressures.

Frame-built Generator Module

- The oxygen generator is fully automatic controlled by a PLC unit. An oxygen analyzer is installed in the below control box.
  Build-in calibration valves and quick connectors for calibration gas ensures easy access for calibration.

Distribution Panel

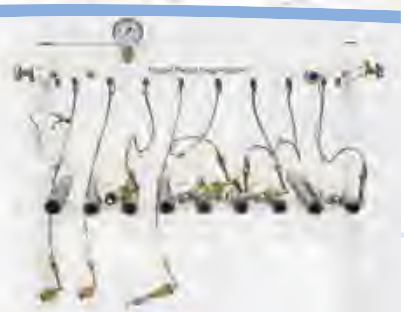
- Main control panel for all incoming and outgoing oxygen pipelines.
- By measuring the oxygen consumption in the hospital, the control system automatically starts up/shuts down the adequate number of plants — hence only the required amount of oxygen is produced.

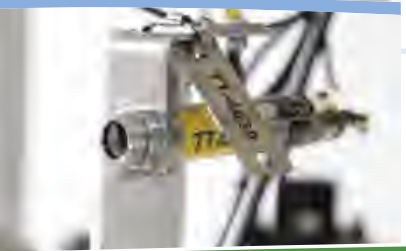
- A high-performance PLC is controlling the full line, from air supply to oxygen generators, backup systems and high pressure filling systems.

- 7” Touch screen unit for control and monitoring of the generator system.
- Features include:
  - Oxygen purity and pressure analyzer
  - Easy access to all values in the system.
  - Carbon dioxide/carbon monoxide analyzers.
  - Data logging with battery back-up, for continuous logging of data even in case of power failure.
  - Ethernet connection to main central control system.
  - Alarm management and password controlled access for different levels of the program.

- Easy visibility of valve status of all in and out going lines.
- Possibility to lock each valve for safety, in case of maintenance of one of the lines.

Technical Features





Backup and High Pressure Filling System

- In the event of high consumption of oxygen the system will activate the backup sources.
  The backup is a fully mechanical controlled device that will supply oxygen to the hospital even in case of main power failure.
  Several sources are available for backup. As standard the back-up system comes either with one or two sources.
  In a one source system the back is controlled by a pressure reduction station, and in case of 2 backup sources the supply is controlled by a changeover pressure reduction.

- To fill high pressure cylinders (5—50L) and bundles for backup or the system is equipped with an oxygen reciprocating com-pressor.
  When the consumption of oxygen is low, for instance during night time, the compressor automatically starts the filling pro-cess.
  The oxygen compressor is absolutely oil free, which ensures that no traces of oil are carried over to the cylinders.
  The compressor system is available in various capacities.

- Rack for filling of small cylinders for internal use in Hospitals or used for homecare filling and rescue services.
- Normal cylinder size would be from 1 to 4 liters cylinders.

- It is possible to run an automatic rinsing/purging sequence of the cylinders before filling operation.
- The sequence will purge the cylinders with pure gas one or several times according to the program settings.
- The purging operation is controlled by inlet and outlet valves and the corresponding pressure measurement on the filling rack.
- This rinsing program will remove the residual gas in the cylinders prior to filling.

- Filling pressure is normally having a reference to a given temperature.
- During filling , the cylinder temperature will vary during the day.
- To compensate for the impact this will have on the cylinder pressure , the filling system is designed with infrared tempera-ture measurement on the cylinders.
- The final filling pressure can then be adjusted to 200 bar at 15°C regardless the ambient conditions.

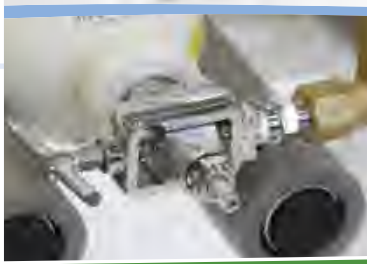
Backup and high pressure filling system

- For further removal of any residual gas and moisture in the cylinders before the filling process we can supply a vacuum system equipped for Oxygen service.
- The vacuum sequences run automatically and are controlled by the vacuum measurement both at the high pressure filling rack and by special vacuum sensors in the vacuum line.
- One or several vacuum sequences are available. This system will fully comply with the European GMP Annex 6: Manufacture of medical gases.

- The connectors for high pressure Oxygen cylinders can be supplied for all given connection standards.
- All constructed in heavy brass and a piece of cooling pipe that will secure the filling hose in case of extensive heat from an adia-batic compression situation.
- In case of residual valves or valves with non-return function we also supply the filling connection with release pin for the given valve system.

- Bundle for backup installations or internal use.
- The bundle can be connected to the backup filling system and will work as a high capacity source of Oxygen supply.
- Bundles can be produced in any size and pressure according to the capacity requirements.
- Compared to the use of separate high pressure cylinders, the bundle has a very small footprint and do not require any heavy handling as it is solely transported by forklift truck or pallet lifter.

- All types of cylinder connections are available.
- For Yoke type cylinder valve (pin-Index) quick acting devices or manually connectors can be supplied.
- For threaded cylinder valve connections we can supply all stand-ards both with internal and external thread and with residual valve release pin.
- All connectors are constructed in heavy brass for many years of daily operation.



- ***Distributors***
- ***Nitrogen Plants***
- ***Oxygen Plants***

The sky is the limit when it comes to the type of industry Oxymat PSA generators serve.

While the bulk of our generators are used in marine and offshore, medical and aquaculture, we also serve many other interesting sectors.

Oxygen generators, for instance, are used in areas ranging from glass work, mining and ozone production to steel and metal cutting and waste water treatment.
The range of use for nitrogen generators is just as wide ranging from petro-chemical and oil industry to electronics and food and beverage.

Oxymat products can be found in all corners of the world, from Asia, Africa and Australia to South America and Europe.
We embrace new challenges and out-of-the-box solutions are designed and developed to serve any need.
Through the years this approach has resulted in state-of-the-art solutions ranging from field hospital filling stations for NATO and Swedish Nuclear power stations to gold mines in Sahara and hospitals in Greenland.

We know that service plays a key role to PSA generator systems, from project start-up to evaluation, and throughout the life-span of the generator system. Once installed our customers rightly expect the generator operate flawlessly and we know that any unforeseen problems can have an immediate and major impact to running any business, whether it is fish farm, an oil tanker or a medical facility. Our highly educated specialist can travel worldwide at short notice. At headquarters in Denmark and branches in Slovakia and China they have a call centre with technically trained staff on duty 24 hours a day.

In addition to our call centre, we have a global network of skilled partners and distributors, who are always at your service, whether your demand is finding an answer to a simple question or helping you, solve a complex issue. Our customers are always our top priority.

Our extensive spare part program ensures day-to-day delivery of high quality original spare parts throughout the lifetime of your plant.

Service agreements

Oxymat Service Agreements are the easiest and best way to ensure you keep the system in perfect working condition. This way, you make sure you will always have the unique performance and reliability that comes with every Oxymat system.

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Highest level of international approval

Oxymat Medical systems are designed and manufactured according to :

- MDD(63/42EEC) Medical Devices Directive
- US Pharmacopoeia
- European Pharmacopoeia
- ISO 10083

Oxymat has long experience in design, engineering and delivery of hundreds of Oxygen systems all over the world, in accordance with international and national authorities.

Oxymat operates a QA system in accordance with EN ISO 9001:2000 and is certified by Apragaz.

- ISO 13485
- ISO 14001