



# Marine



Worldwide Manufacturer of PSA Generators

# Oxymat at a Glance

# Bringing Nitrogen Generator Systems to Your Business

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 possess 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 tailor 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

Why are Oxymat PSA generators the wise choice?

At Oxymat, we only see challenges - not problems! No matter your need or application we can provide state-of-the-art design of inert Gas Generators (IGG) to meet your requirements. Our wide range of standard generator systems supply Nitrogen from 4.8 to 10,000 Sm<sup>3</sup>/h with purities up to 20ppm (300TPD)

Unique Oxymat design features include:

- High performance top quality solutions
- Low energy consumption (from 0,2kW/m<sup>3</sup> Nitrogen and from 1,0 kW/m<sup>3</sup> Oxygen)
- Skid mounted with split functionality on large plants
- Low CO<sub>2</sub> emission
- Heavy duty construction designed for rough conditions and marine use
- High quality & durable components
- 3D design
- Optional container or Frame-built design
- Design and customization, to meet any specification
- Trouble-free installation
- High quality Touch Screen Control Unit
- Remote Control Access
- Specialist support from planning, installation and operation of your project
- Oxymat is approved and recognized as a quality supplier by major gas companies

The essence of PSA

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The PSA process is an extremely clean operation and the only 'raw material' is air.

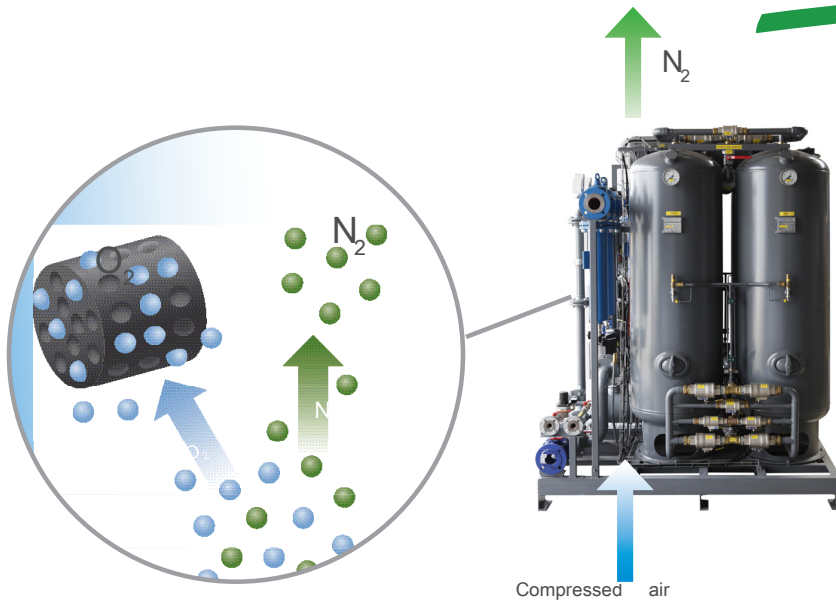
On-site generators allow for an uninterrupted supply of gas with a high purity output. This means that you can produce gas where and when you need it, and in the exact quantity and quality you need.

Our X-series nitrogen generator systems are available in 15 models with cover flow rates from 4.8 to 10,000 Sm<sup>3</sup>/h. For lower capacities or for ships with high peak consumption ( e.g. LNG ferries) we can design a smaller system with high pressure cylinders.

Advanced Control System

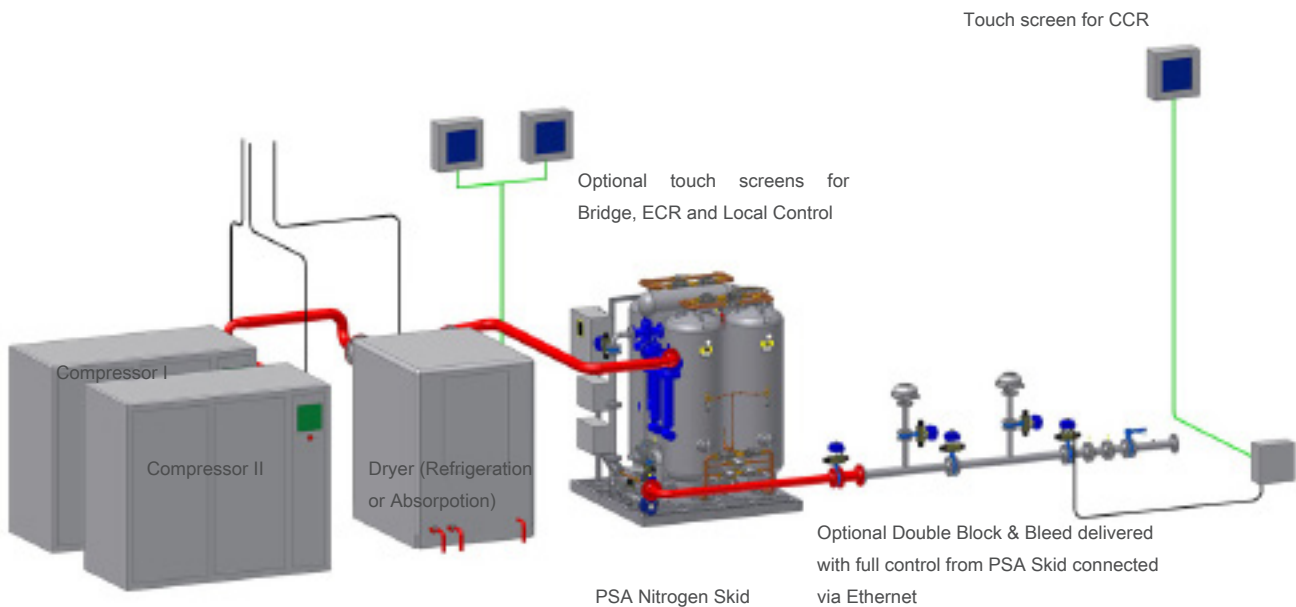
All models operate with our own developed Control Systems, spanning from the simplest Control System to the most Advanced System with Touch Control Screen, which makes day-to-day operation very simple for the user.

# Technology / Process Description



Inert Gas Generators according to class

DNV, LR, GL, BV, ABS, RINA, NK, CCS, etc. All OxyMat X-series PSA generators are naturally delivered according to the Classification Society requirements, including Factory Acceptance Test.



OxyMat new revolutionary X-Series provide you with following benefits:

- Very easy installation, totally 2-3 Compressors, one dryer and one PSA skid. All signals connected with Ethernet (hybrid cable)
- World's smallest footprint, our unique design eliminates need for air and nitrogen receivers and PSA performance is increased with 50% versus conventional PSA
- Very low power consumption. At 5% purity power consumption is only 0.19-0.22 kW per  $Sm^3$  of  $N_2$  against membranes systems using 0.39 kW per  $Sm^3$  of  $N_2$
- Minimized cabling, gives easiest and fastest installation time onboard, very easy user interface with expandable number of monitors wherever you like. Remote access via GSM or internet for on-line service
- Charge/discharge mode with pressure control of cargo holes makes operation fully automatic
- Can be integrated with ship power management system

# Technical Parameters

## World's Smallest Footprint

Our X-Series design is not just highly functional and energy efficient, but also very compact, it has the smallest footprint when it comes to flow per m<sup>2</sup>.



Optional Nitrogen padding  
down to 20 ppm



- When choose our nitrogen padding solution, it does not need to equip vessels with Nitrogen bottles.
- We can offer down to 20 ppm purity and the best thing is that changeover from 5 % production to 20 ppm takes less than 20 minutes. A special oxygen sensor cabinet is delivered to monitor precise and reliable readings from 2-1000 ppm

Central drain system



- The PSA skid has central pipes for sludge, so it has only one connection point to the PSA.

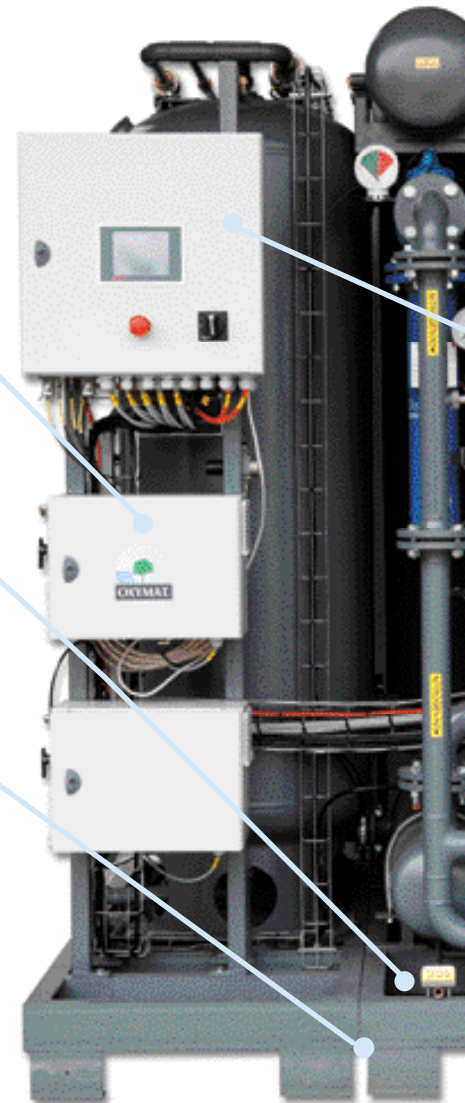
Dividable skid



- Skid can be devided into 2 for easy installation, and is particularly practical on retrofits or when space is a scarce commodity

“Even though PSA plants have initial higher cost than traditional membrane systems, the advantages of PSA plants far out beat the cost with longer life-span and easy tank regulation of O<sub>2</sub> flow. Choosing a N<sub>2</sub> plant from Oxymat gave us a system that covered our N<sub>2</sub> needs for chemical tankers in a real simple manner.”

Ove Normann  
Technical Manager  
Odfjell SE





## On-site Inert Gas Generators

The Oxymat X-series PSA nitrogen generators combines cost and space efficiency in one unit, and the versatile design allows use for a wide array of applications. So whether the use is padding, purging, super-stripping or ballast water treatment - just to name some - the X-series will fulfill the purpose.



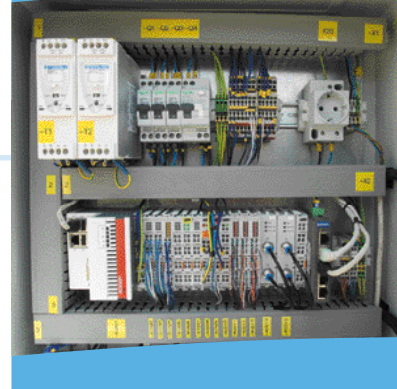
### Optional double block and bleed system

- This class approved safety system can be delivered as an integrated part of the PSA system for on deck placement, quality components for on deck installation is chosen.
- The DBB system keeps pressure in cargo tanks at 0.2 bar or after customized specification



### The most simple and advanced control

- With simple and easy to use touch screen, self diagnosing, only one wire from instrument to PLC, easy internet access, there can be screens where ever in CCR, in ECR and on bridge in fully compliance with class rules.



### Performance Chart

	Sm <sup>3</sup> /hour	Pressure
5% O <sub>2</sub> content	60-10,000	Inlet 4-11 bar (g) Outlet 3-10 bar (g)
0.5% O <sub>2</sub> content	21.6-3,600	
20ppm O <sub>2</sub> content	4.8-800	

# Technical Parameters

## Lowest Energy Consumption

Our X-Series energy consumption is very low, which ranges from 0.2 kW to 1.0 kW, depending on capacity and purity. This is of course a great advantage for ships at sea, as it is directly transferable to lower fuel consumption.



### Flow control



- All our PSA is as standard equipped with flow control system, the flow can be set on the touch screen and can choose all settings from 0 - maximum capacity.

### Optional dry air by pass

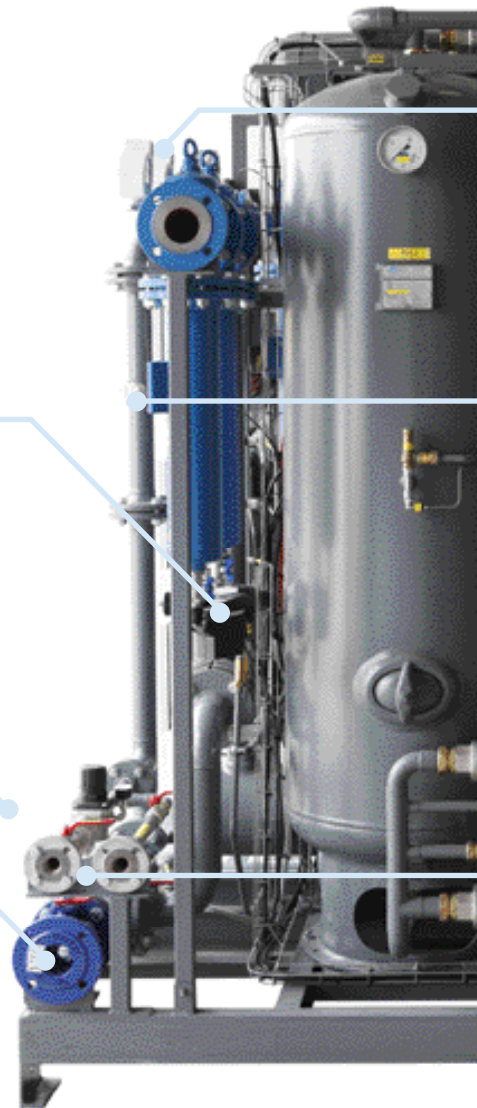


- When needs dry air with an atmospheric dew point of -20 C, use the Nitrogen Systems existing compressors.

### Compressed air in



- Simple Flange connection to ease installation on both compressed air inlet and product outlet.



“We chose a PSA system because it gave us several advantages to a membrane system. The system is more reliable with both higher quantity and purity output. At the same time, maintenance is simpler with reduced cost for replacing parts, especially membrane filters.”

Horst Baumann  
Ahrenkiel Consulting Services GmbH & Co. KG  
Suisse Outremer Ahrenkiel & Co.

## Air Consumption Chart

	Air Consumption	Air to Product Ratio
5% O <sub>2</sub> Content	120-20,000	2.0
0.5% O <sub>2</sub> Content	64.8-10,800	3.0
20ppm O <sub>2</sub> Content	33.6-5,600	7.0



### Filter control



- Our filters are equipped with filteralarm, you will be told when to change the element.

### Flow meter



- We do always equip our marine systems with flow meters it gives full control of cargo operations

### Outlet pressure

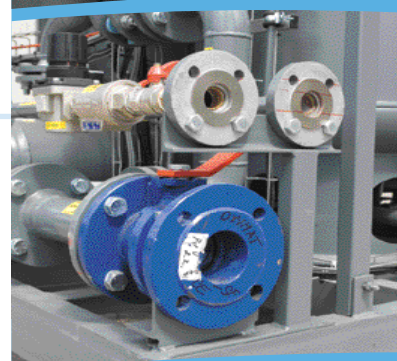


- Optional due pressure outlets for multi purpose use of the PSA IGG.

### Exhaust silencer



- Our new designed silencer keeps noise level from PSA below 85 dB, a standard flange eases the installation





## OXYMAT A/S

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### Highest level of international approval

Oxymat Nitrogen systems are designed and manufactured according to :

- PED(97/23/EC)

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

Oxymat operates management systems in accordance with international standards

- ISO 9001 (Quality Management Systems)
  - ISO 14001 (Environmental Management Systems)
- certified by Apragaz.

