

OXYGEN GENERATORS



*Largest
Product
Offering*

*Highest
Efficiency*

*Highest
Purity*

*Lowest
Cost*



**From Concept To Completion,
We Sell Solutions!**

OXYSWING® – Oxygen Generators

OUR TECHNOLOGY

IGS has over 30 years experience in the design and manufacturing of Pressure Swing Adsorption (PSA) plants. We are at the forefront of this technology and have the flexibility to provide the right package to meet all customer requirements. IGS' OXYSWING® oxygen generator systems use the basic principle of passing air over adsorbent material which bonds with nitrogen to leave a rich stream of oxygen.

The adsorptive separation of air is accomplished in the following process steps:

1. FEED AIR COMPRESSION AND CONDITIONING

The ambient (inlet) air is compressed by an air compressor, subsequently dried by an air dryer and filtered before entering the process vessels.

2. ADSORPTION

The pre-treated air is passed into a vessel filled with Zeolite Molecular Sieve (ZMS) where most of the oxygen is passed through while nitrogen and other gases are adsorbed. Before the adsorption capacity of the ZMS is exhausted the adsorption process is interrupted.

3. DESORPTION

The saturated ZMS is regenerated (i.e. the adsorbed gases are released) by means of pressure reduction below that of the adsorption step. This is achieved by a simple pressure release system. The resultant waste stream is vented into atmosphere. The regenerated adsorbent is purged with oxygen and will now be used again for the generation of oxygen.

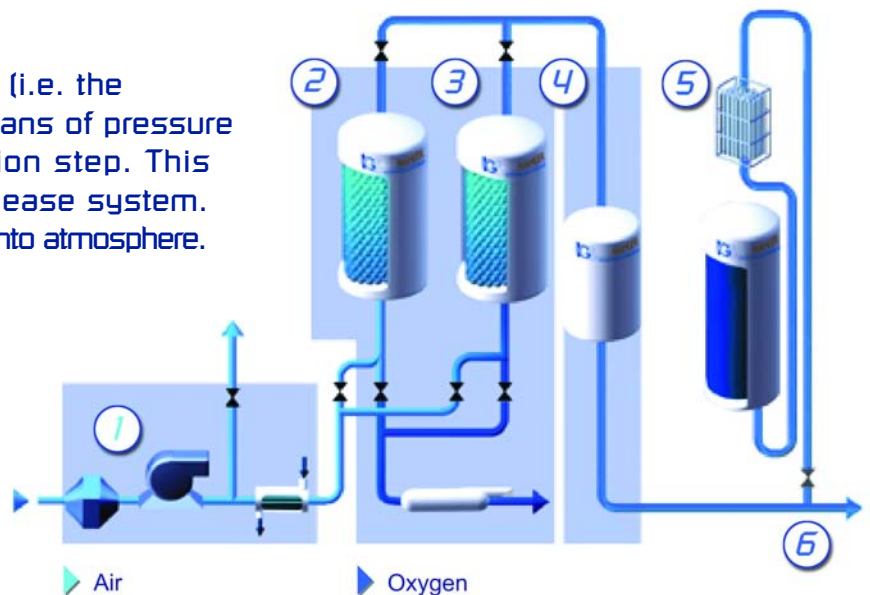
4. OXYGEN RECEIVER

Adsorption and desorption take place alternately at equal time intervals. This means that the continuous generation of oxygen can be achieved with two adsorbers, one being switched at adsorption and the other at regeneration. Constant product flow and purity is ensured by a connected oxygen receiver that stores the oxygen at purities up to 95% and pressures up to 4.5 bar(g) / 65 psig.

5. OPTIONAL BACKUP SYSTEM

6. OXYGEN PRODUCT

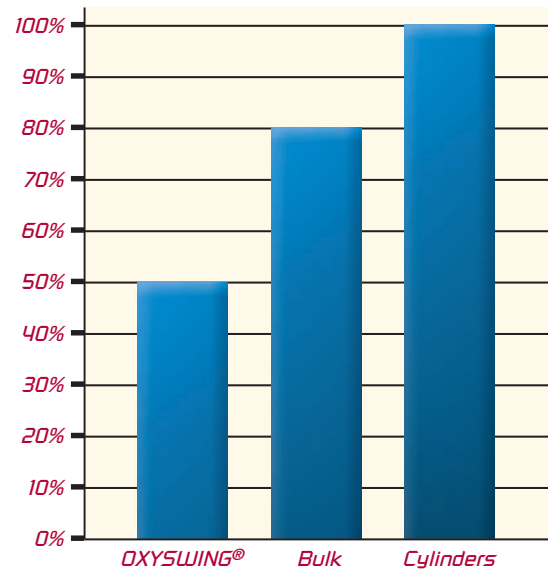
The result is a constant stream of on-site produced oxygen at cost significantly below that of liquid or bottled gases.



Highlights and System Features

HIGHLIGHTS

- Proven designs with over 30 years experience building one of the world's largest portfolios of oxygen generators with units starting at 1.3 Nm³/h / 49 scfh
- Over 1500 industrial systems installed in every part of the globe
- Plants designed for years of trouble free operation
- Cost advantage of an OXYSWING® Oxygen Generator
 - Cost saving of 30% over Bulk Liquid or 50% over oxygen cylinders
 - No safety or handling issues with bulky high pressure cylinders or dangerous cryogenic liquids
 - No complicated supply contracts with ever escalating charges



SYSTEM FEATURES

IGS supplies OXYSWING® oxygen generator systems with the following features:

- Purities to 95%
- Plant capacity to 120 Nm³/h or 4,596 scfh
- Delivery pressure to 4.5 bar(g) / 65 psig without post-compression
- Cabinet, skidded and containerized systems
- FDA approved systems for medical applications
- Flexible design for all locations
 - Indoor
 - Outdoor
 - Skids
- Custom designed systems to meet your exact requirements

Safety:

- ▲ Low Operating Pressure
- ▲ No Hazardous Storage

Economy:

- ▲ Low Operating Costs
- ▲ Low Air Consumption
- ▲ Low Pressure Drop
- ▲ High User Pressure

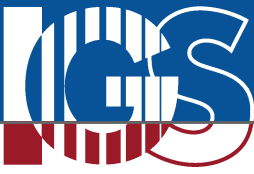
Convenience:

- ▲ Fully Automated
- ▲ Unattended Operation

Reliability:

- ▲ Easy to Install
- ▲ Easy to Maintain
- ▲ Safe process operation for long ZMS life

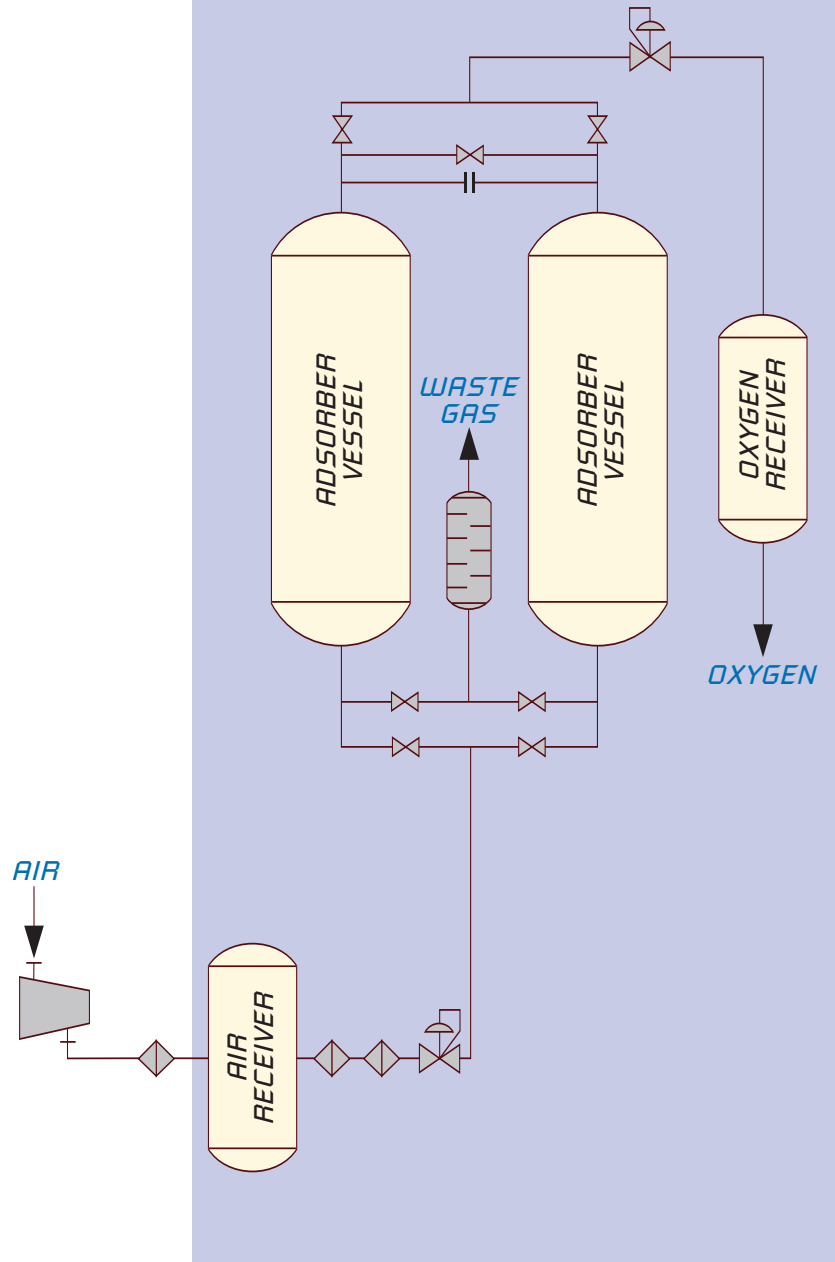
All systems supported by our global service network.



Standards and System Options

STANDARD APPLICATIONS

- Fish Farming
- Feed Gas for Ozone Generators
- Foundries
- Glass and Neon Manufacturing
- NOx Reductions for Fuel Burners
- Water Treatment
- Welding, Brazing and Soldering
- Medical Clinics
- Environmental Remediation
- Apartment/Bedroom Air Enrichment



STANDARD COMPONENTS

- Air Filters
- Adsorber Vessels
- Pneumatic Valves
- Internal Piping and Instrumentation
- Safety Valves
- Exhaust Muffler
- Air and Oxygen Pressure Regulator
- Control System with Allen-Bradley PLC
- Skid Mounted
- Hour Meter
- Pressure Switch for automated Idle-Mode

OPTIONS

- Oxygen Analyzer (Zirconium Oxide type) with Fail-Safe Feature (automatic venting of off-spec oxygen to the atmosphere)*
- Dew Point Analyzer
- Electronic Product Flow Meter
- Feed Air/Oxygen Pressure Transducer
- Feed Air/Oxygen Temperature Transducer
- Product Flow Totalizer
- Allen-Bradley PanelView™ Graphical Display
- Noise Reduction Package
- Telemetry
- Medical Upgrade
- Feed Air System
- Product Booster Compressor
- Cylinder Filling Station

* Oxygen Analyzer becomes a standard component for medical applications.

OXYSWING® Oxygen Generator Performance Specifications

Model	Oxygen %	Product Output		Feed Air Nm³/m
		O2 Nm³/h	P bar(g)	
OS-4	90	1.70	3.40	0.31
	93	1.60	3.40	0.30
	95	1.30	3.20	0.30
OS-5	90	2.50	3.30	0.44
	93	2.30	3.30	0.40
	95	1.90	3.30	0.40
OS-7	90	3.30	3.40	0.57
	93	2.90	3.20	0.53
	95	2.60	3.20	0.53
OS-9	90	4.30	3.30	0.75
	93	3.80	3.40	0.72
	95	3.50	3.30	0.73
OS-15	90	6.50	3.30	1.15
	93	5.60	3.30	1.03
	95	5.60	3.30	1.13
OS-20	90	7.80	3.30	1.39
	93	6.50	3.30	1.23
	95	6.80	3.30	1.42
OS-25	90	9.50	3.30	1.76
	93	7.80	3.10	1.50
	95	8.30	3.20	1.73
OS-30	90	12.50	3.20	2.22
	93	11.70	3.30	2.15
	95	9.60	3.20	2.08
OS-45	90	17.40	3.30	3.12
	93	16.20	3.30	3.07
	95	14.60	3.20	3.15
OS-70	90	27.60	3.20	5.01
	93	25.30	3.20	4.75
	95	22.60	3.10	4.72
OS-85	90	35.20	3.20	6.46
	93	31.60	3.20	6.17
	95	28.30	3.10	6.25
OS-100	90	42.40	3.10	7.83
	93	38.40	3.10	7.50
	95	34.10	3.10	7.50
OS-110	90	50.00	3.10	9.35
	93	44.50	3.10	9.17
	95	40.20	3.10	9.17
OS-160	90	67.80	3.10	12.71
	93	59.60	3.10	12.17
	95	53.40	3.00	12.17
OS-180	90	77.60	3.10	14.88
	93	68.00	3.10	14.17
	95	61.30	3.00	14.33
OS-220	90	95.00	3.10	18.46
	93	83.00	3.00	17.83
	95	75.80	3.00	17.83
OS-280	90	120.80	3.10	23.66
	93	105.70	3.00	22.50
	95	98.00	3.00	22.50

SI-SPECIFICATIONS

Larger capacity systems are available upon request. Additionally, see our product offering for large tonnage plants (160T/D) utilizing IGS's unique VPSA Technology. Upon request 99% high purity oxygen or output pressures up to 4.5 bar(g) can be supplied with the same OXYSWING® oxygen generators.

OXYSWING® Oxygen Generator Performance Specifications

US STANDARD SPECIFICATIONS

Model	Oxygen %	Product Output		Feed Air scfm
		O2 scfh	P psig	
OS-4	90	65	49	12
	93	61	49	11
	95	49	46	11
OS-5	90	95	48	17
	93	88	48	15
	95	72	48	15
OS-7	90	126	49	22
	93	110	46	20
	95	99	46	20
OS-9	90	164	48	29
	93	145	49	27
	95	133	48	28
OS-15	90	247	48	44
	93	213	48	39
	95	213	48	43
OS-20	90	297	48	53
	93	247	48	47
	95	259	48	54
OS-25	90	361	48	67
	93	297	45	57
	95	316	46	66
OS-30	90	476	46	84
	93	445	48	82
	95	365	46	79
OS-45	90	662	48	119
	93	616	48	117
	95	555	46	120
OS-70	90	1050	46	191
	93	963	46	181
	95	860	45	180
OS-85	90	1339	46	246
	93	1202	46	235
	95	1077	45	238
OS-100	90	1613	45	298
	93	1461	45	285
	95	1297	45	285
OS-110	90	1902	45	356
	93	1693	45	349
	95	1529	45	349
OS-160	90	2579	45	484
	93	2267	45	463
	95	2032	44	463
OS-180	90	2952	45	566
	93	2587	45	539
	95	2332	44	545
OS-220	90	3614	45	702
	93	3158	44	678
	95	2884	44	678
OS-280	90	4596	45	900
	93	4021	44	856
	95	3728	44	856

Larger capacity systems are available upon request. Additionally, see our product offering for large tonnage plants (160T/D) utilizing IGS's unique VPSA Technology. Upon request 99% high purity oxygen or output pressures up to 65 psig can be supplied with the same OXYSWING® oxygen generators.

IGS References and Standards

Customer Reference List

- ▲ Air Liquide
- ▲ BOC Process Plants
- ▲ Can-Tech/Adatif
- ▲ Caritas
- ▲ Energy Recovery
- ▲ HT2
- ▲ Hydro Polymers
- ▲ Ionics
- ▲ Lindner
- ▲ Maritime Research Institute
- ▲ Messer
- ▲ Mortelmans
- ▲ Multix
- ▲ Novair
- ▲ Oxideas
- ▲ Praxair/Ozonvia
- ▲ Siemens
- ▲ Sobel, Inc.
- ▲ Toromont Process
- ▲ Ultrafilter

Industry Standards

- ▲ ASME
- ▲ CE/PED
- ▲ ATEX/CENELEC
- ▲ DNV
- ▲ Lloyds Register
- ▲ CSA
- ▲ Bureau Veritas
- ▲ ABS
- ▲ Baseefa
- ▲ IEC/NEC
- ▲ NFPA RINA
- ▲ Class I Div 2
- ▲ Zone 2
- ▲ GOST
- ▲ Class NK
- ▲ Germanischer Lloyd
- ▲ NEMA/IP
- ▲ Customer Specifications

Systems Sold:

IGS has sold over 1,500 Oxygen Generating Systems

- | | | | |
|----------------------------------|-----|--|----|
| ▲ Glass Plant Systems: | 500 | ▲ Waste Treatment / Municipality / Ozone Plants: | 35 |
| ▲ Steel & Metallurgical Systems: | 400 | ▲ Aquaculture / Fish Farms Systems: | 21 |
| ▲ Welding & Soldering: | 100 | ▲ Medical Hospital / Clinic: | 45 |
| ▲ Pulp & Paper Systems: | 150 | | |

IGS INNOVATIVE GAS SYSTEMS

- ❑ Innovative Gas Systems is a global technology company with operational centers in North America, South America, Europe and Asia.
- ❑ Our products are world class with over 75 patents supporting our innovative technology in Nitrogen/Dehydration membranes, Nitrogen PSA and Oxygen PSA/VPSA.
- ❑ Please visit our website for a review of the complete list of products from IGS or contact one of our local sales associates directly.



website
www.igs-global.com

e-mail
igssales@igs-global.com

AMERICAS

Generon® IGS
 11985 FM 529
 Houston, TX 77041 USA
 +1.713.937.5200 phone
 +1.713.937.5250 fax

Generon® IGS Brazil
 Av. Atlântica, 2500 sala 25
 Praia dos Cavaleiros
 27920-390 Macaé RJ, Brazil
 +55.22.2773.5443 phone
 +55.22.2757.1492 fax

EUROPE

Generon® IGS Europe
 c/o Office Center KÖ66
 Königsallee 66
 D-40212 Düsseldorf, Germany
 +49.211.86.691.45 phone
 +49.211.86.691.46 fax

Generon® IGS GUS Ltd
 S. Entuziastov 56/25
 Moscow, Russia
 +7.095.525.6744 phone

IGS Italia s.r.l.
 Via Giordania, 48
 58100 Grosseto, Italy
 +39.0564.4580.41/42 phone
 +39.0564.4580.43 fax

ASIA

IGS SMC Asia Gas System Co. Ltd.
 Shungfeng Rd., Shuangliu Aviation Harbor
 Chengdu, Sichuan, P.R. China 610225
 +86.28.8588.2034 phone
 +86.28.8588.2037 fax

IGS Asia Co., Ltd.
 2/3 Moo 14 Bangna Tower A
 17th Floor, Bangna-Trad Rd., Bangplee,
 Samutprakarn 10540, Thailand
 +66.2751.9495 phone
 +66.2751.9497 fax