MEDICAL

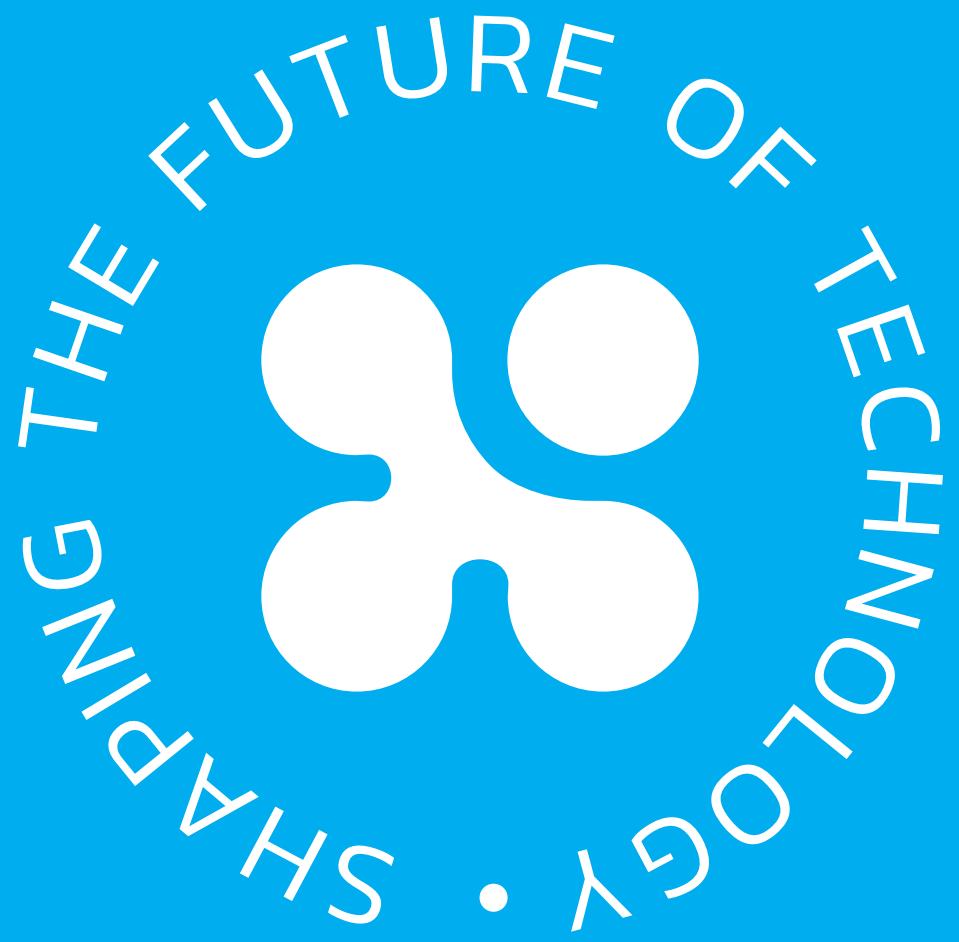
AIR**SYS M**

VACUUM**SYS M**

MEDICAL

sysadvance®

EN


SHAPING THE FUTURE OF TECHNOLOGY

sysadvance®

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MD

SYSADVANCE · Sistemas de Engenharia S.A.

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CE
0051

THE COMPANY

SYSADVANCE develops and manufactures on-site gas generators and gas purifiers, as well as integrated solutions for compressed air and technical gases, it offers a large product portfolio such as Nitrogen Generators, Oxygen Generators, including Medical Oxygen 93 and VSA Oxygen Generators, Medical Air Systems, Medical Vacuum systems, solutions for purification of biogas, Helium, Hydrogen and SF6, as well as customized engineered products.

SYSADVANCE gas generation and purification products offer professional solutions for several industries and sectors such as: chemical and pharmaceutical, electronic components, metal works, aquaculture, water treatment, engineering, automotive, food, wine, aviation, marine, energy, medical, oil and gas, among others.

The attention to client's needs, adapting the offer to these needs and always exceeding client's expectations, with a focus on bringing value-for money solutions, have been the paramount reasons for **SYSADVANCE**'s success.

Technology, Innovation and Quality – Those pillars have driven **SYSADVANCE**'s growth in the past 20+ years and will continue to be the company's motivation for years to come.

And the future is here: The foundation of **SYSADVANCE**'s first international operation, with the launching of **SYSADVANCE** North America Technologies Inc., based out of Vancouver, British Columbia, marks the beginning of a new phase in **SYSADVANCE** global market presence, bringing its products and services closer to clients in different continents.

A direct presence in key markets is nowadays the driver to achieve growth, and continue to serve **SYSADVANCE**'s clients, bringing value and quality through our extensive line of products and excellent service level.

PSA TECHNOLOGY

PRESSURE SWING ADSORPTION

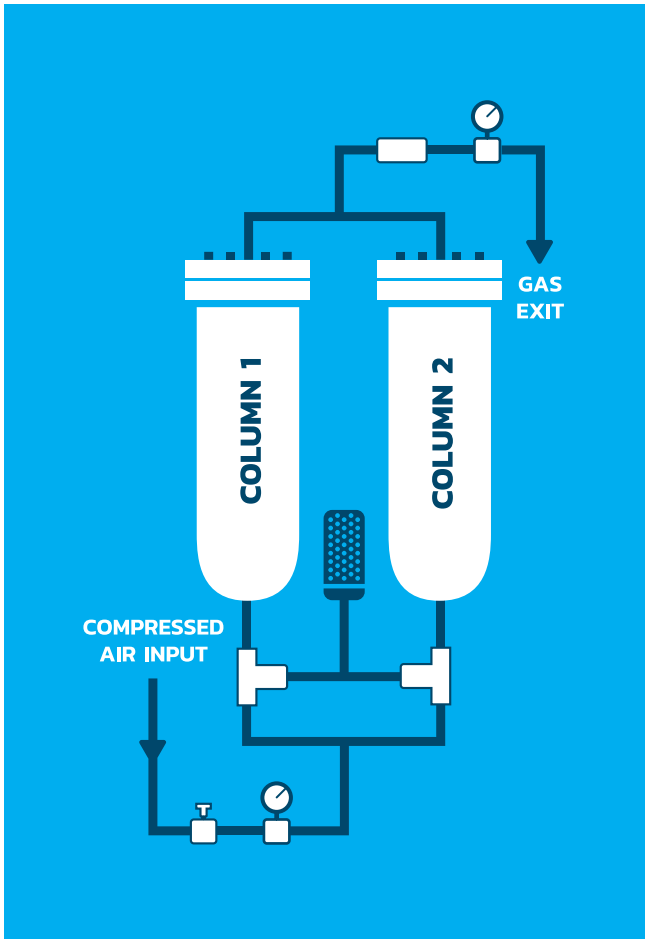
Pressure Swing Adsorption can be used to produce Oxygen from compressed air, which is fed to the unit that uses adsorption phenomena to remove contaminants: H_2O and CO_2 are removed along with other minor contaminants.

The PSA unit contains two columns packed with a selective adsorbent that has affinity towards the undesirable components: zeolite is used to produce O_2.

Each column undergoes a cyclic sequence of high and low pressure steps that guarantees the production of a continuous flow of high purity gas.

In the high pressure step, the adsorbent retains the contaminants present in the compressed air and the desired gas (O_2) is obtained from the top of the columns.

The regeneration is accomplished in the low pressure step, as the adsorbent releases the retained contaminants.

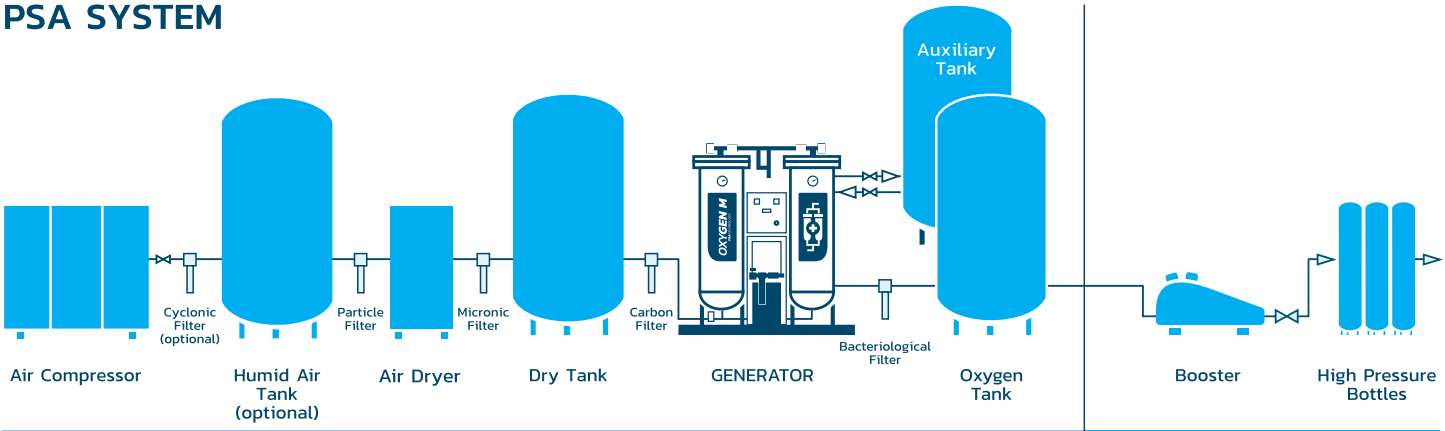


PSA TECHNOLOGY

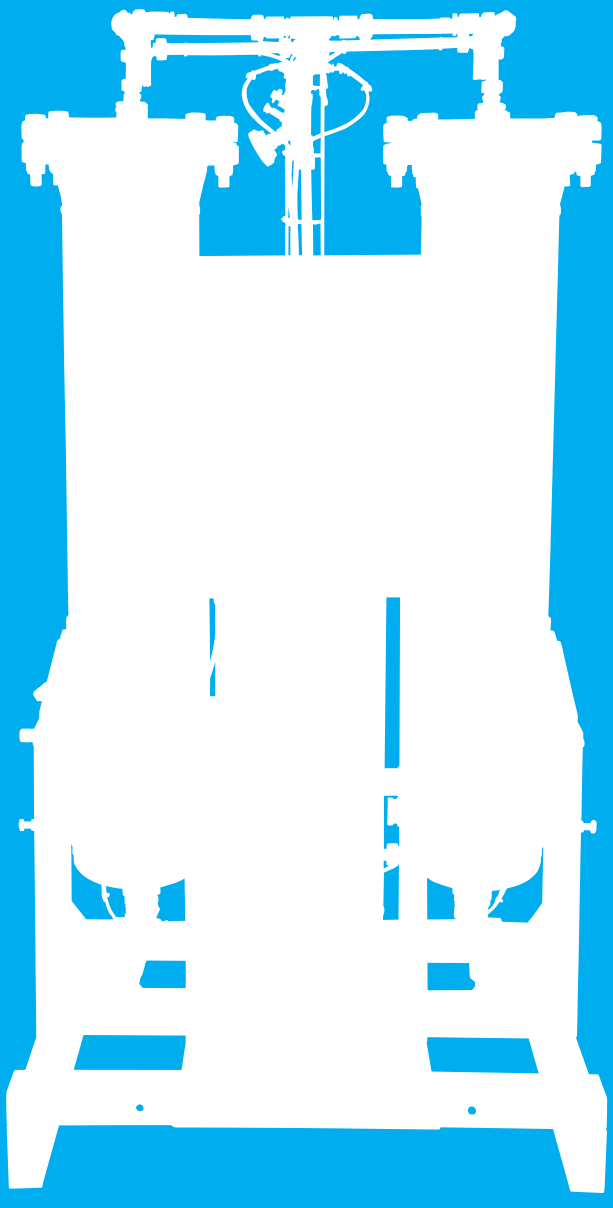
PSA ADVANTAGES

- **ECONOMY**
  – 90% reduction of the cost of Oxygen
- **CONVENIENCE**
  – elimination of logistical and administrative operations
- **CONTINUOUS AVAILABILITY**
  – elimination of orders and deliveries
- **MODULARITY/ SCALABILITY**
  – easy future expansion
- **ROBUSTNESS, RELIABILITY AND DURABILITY**
- **REDUCED MAINTENANCE**
- **SECURITY**
- **READY-TO-USE ENGINEERING SOLUTIONS**

PSA SYSTEM



OXYGEN GENERATORS



PSA TECHNOLOGY

OXYGEN M SERIES

PSA TECHNOLOGY
OXYGEN M SERIES

DESCRIPTION

SYSADVANCE medical Oxygen concentrators and systems **OXYGEN M Series** are intended to be used in hospitals facilities as a medical Oxygen supplier.

Medical applications of Oxygen 93% consist of Oxygen therapy treatments, use of O2 93% in anesthesia ventilators, life support with O2 93% delivered by ventilator and hyperbaric Oxygen therapy, according to European Pharmacopoeia (Oxygen 93% Monograph) requirements.

The Oxygen unit is fully automated and controlled by a PLC.

ADVANTAGES

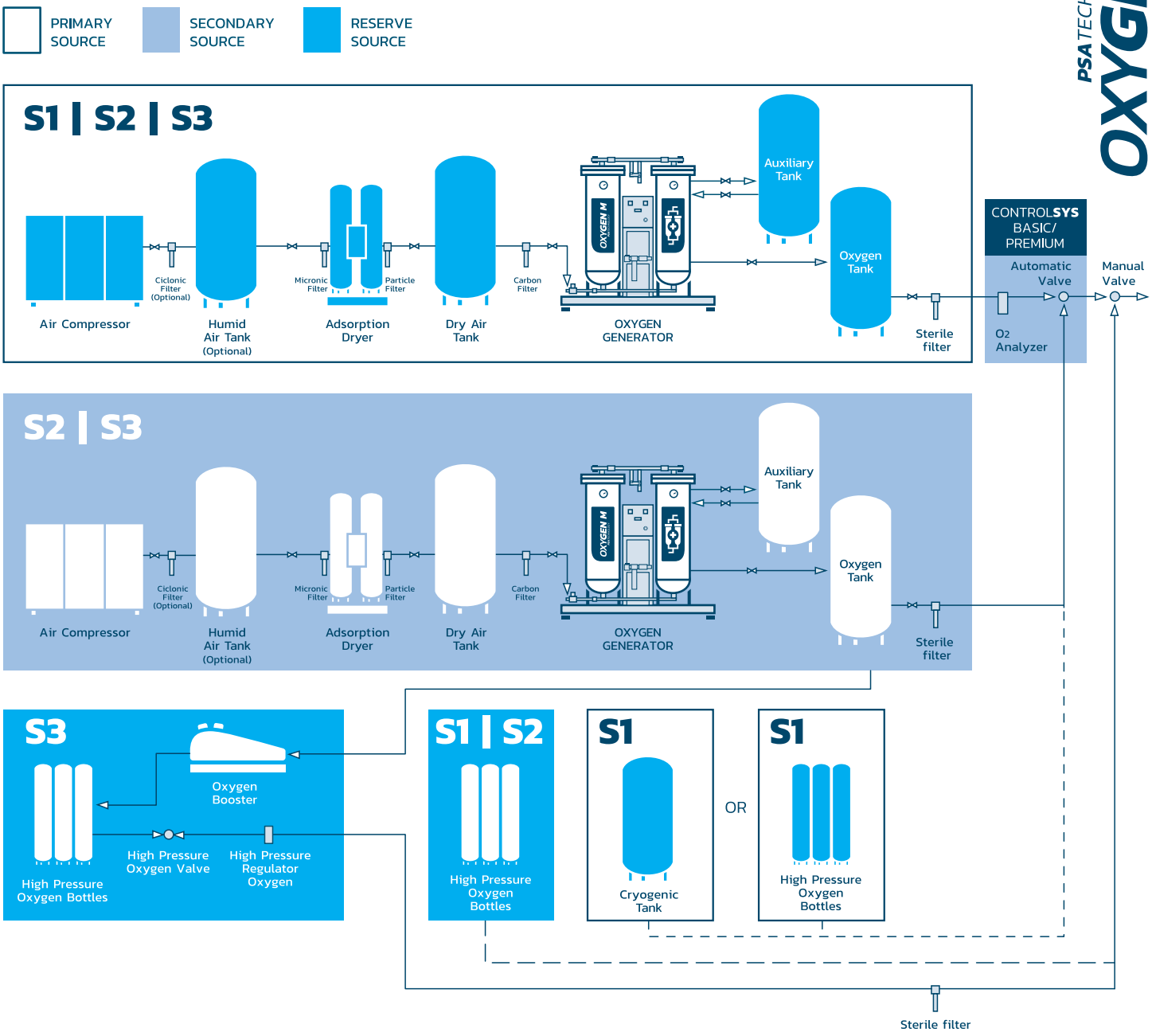
- **ECONOMY**
  - Reduction of 90% of Oxygen costs;
- **COMFORT**
  - Elimination of the logistic and Administrative operations;
- **CONTINOUS AVAILABILITY**
  - Elimination of orders and deliveries;
- **SECURITY**
  - Low pressure non-cryogenic solution;
- **CERTIFICATION**
  - Certified quality management system according to ISO 13485
  - Medical devices meet the requirements of regulation (EU) 2017/745 including the CE mark and a certificate issued by IMQ S.p.A, NB 0051.;
- **CONTAINER AND SKID-MOUNTED** solutions available.

INSTALLATION OPTIONS IN ACCORDANCE WITH THE STANDARD:

POSSIBLE SYSTEM CONFIGURATION OPTIONS:

- **S1** · 1 PSA system + 2 external sources (cryogenic and/or cylinders)
- **S2** · 2 PSA systems + 1 external source (cylinders)
- **S3** · 2 PSA systems + 1 high-pressure emergency backup system

THE OXYGEN SUPPLY SYSTEM SHOULD HAVE 3 SOURCES OF SUPPLY:
- PRIMARY, SECUNDARY AND RESERVE.



*ISO 7396-1 - Pipeline systems for compressed medical gases**

** ISO 7396-1 replaces ISO 10083*

PSA TECHNOLOGY

OXYGEN M SERIES

EUROPEAN PHARMACOPOEIA REQUIREMENTS FOR MEDICAL OXYGEN 93%

O_2	93% ± 3%
CO_2	≤ 300 ppm V/V
CO	≤ 5 ppm V/V
NO e NO_2	< 2 ppm V/V
SO_2	≤ 1 ppm V/V
OIL	≤ 0.1 mg/ m3
WATER	≤ 67 ppm V/V

CE 0051

ADVANTAGES OF FULL SYSTEM CERTIFICATION

**** SYSADVANCE designs and installs Oxygen PSA Generators and Systems to produce according to European Pharmacopoeia Oxygen 93% Monograph.***

**** SYSADVANCE Medical Devices Certification scope comprises the concentrator stand-alone or the full system.***

**** Full system certification includes:***

- Dimentioning and specification;
- Manufacturing;
- Full test and factory validation including mass spectrometer analysis;
- As-built layout and P&ID;
- Installation, start-up and training;
- On-site validation;
- Certified maintenance program;
- Periodic assessment of gas quality;
- Oxygen monitoring compliance.

SYSADVANCE system certification provides health care facilities with Oxygen quality and security of supply under Oxygen 93% Monograph requirements.

PSA TECHNOLOGY
OXYGEN M SERIES

QUALITY & CERTIFICATION

SYSADVANCE Oxygen generators and systems are CE marked under Medical Devices Regulation (EU) 2017/745 (class IIb) and Oxygen produced complies with European Pharmacopoeia – Oxygen 93% Monograph.

Full system installations can be certified by **SYSADVANCE** if installed according to approved specification.

BASIC MONITORING SYSTEM

Features

- Pressure | Purity | Flow Rate
- Ethernet
- O_2 Sensor
  - O_2 with zirconia or paramagnetic sensor

ADVANCED MONITORING SYSTEM

Features

- Pressure | Purity | Flow rate
- Siemens PLC S7 + 7" touch screen
- Communication mode via Freeport | 3964 R | Modbus RTU
- Ethernet
- Remote monitoring | SMS alarm
  - Webserver | SmartServer
- O_2 | CO | CO_2 | Dew Point Sensor
  - O_2 with zirconia or paramagnetic sensor

PERFORMANCE

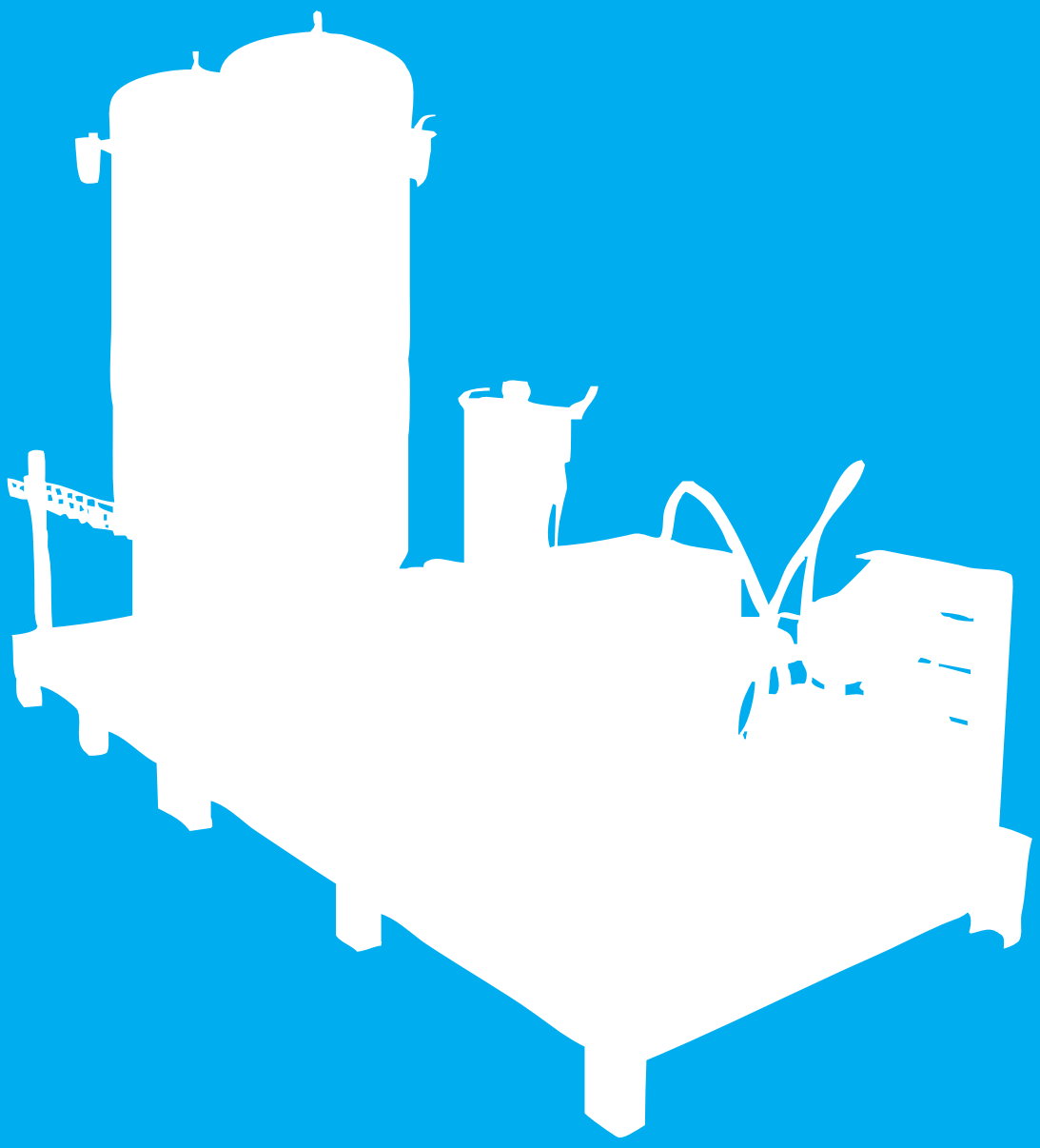
MODEL	93%			Air consumption	95%			Air consumption
	Sm^3/h	Nl / min	SCFH	Sm^3/h	Sm^3/h	Nl / min	SCFH	Sm^3/h
OXYGEN 10M	1,1	18	38	12	0,9	16	33	12
OXYGEN 25M	2,1	34,5	73,1	23,4	1,7	27,8	58,9	21,1
OXYGEN 35M	3,1	52	109	35	2,5	42	88	32
OXYGEN 50M	4,6	77	162	52	3,8	63	134	47
OXYGEN 70M	6,5	108	230	74	5,3	88	187	66
OXYGEN 80M	8,0	133	282	90	6,5	108	230	81
OXYGEN 90M	9,5	158	335	108	7,8	130	275	97
OXYGEN 110M	12,4	207	438	141	10,1	168	357	126
OXYGEN 150M	18,2	303	643	206	14,8	247	523	185
OXYGEN 200M	26,2	437	925	296	21,3	355	752	266
OXYGEN 300M	36,5	608	1289	413	29,7	495	1049	371
OXYGEN 400M	43,5	725	1536	492	35,3	588	1246	442
OXYGEN 500M	55,7	928	1967	629	45,2	753	1596	566
OXYGEN 800M	82,7	1378	2918	934	67,2	1119	2372	839

Performance at preference conditions 20°C and 1 bar atmospheric pressure.

Purity values are measured in oxygen content (Variation ± 1.5%). Purity values may slightly vary during the lifetime of the generator and are dependent, among other factors, on the inlet compressed air (CA) quality.

Dew-point: an adsorption air dryer (-40°C dew-point) is required. The produced oxygen flow will have a dew-point of -60°C (<50ppm of water vapour).
Required inlet compressed air quality is 1:2:1 as in ISO 8573-1.

MEDICAL AIR



AirSYS M

AirSYS M

DESCRIPTION

SYSADVANCE Medical Air Systems **AirSYS M Series** are intended to be used in hospitals facilities as a medical air supplier.

Medical air in gas state is mainly used in respiratory therapy, as a power source for patient ventilators, and for blending with Oxygen. It is also used as the driving gas for nebulized drugs and chemotherapy agents, according to European Pharmacopoeia (Medical Air Monograph) requirements.

These systems are not intended to contact directly with the patient. They are designed to be installed in a technical facility within the hospital/clinic premises, but in a restricted area away from patients, medical personnel and general public, and intended to supply gas to several patients via the hospital or clinic medical gas pipeline system, already installed in the hospital/ clinic.

ADVANTAGES

- **ECONOMY**
  - Reduction of medical air costs;
- **CONTINUOUS AVAILABILITY**
  - Elimination of orders and deliveries;
- **CONVENIENCE**
  - Elimination of the logistic and Administrative operations;
- **CERTIFICATION**
  - Certified quality management system According to ISO 13485;
  - Medical devices meet the requirements of regulation (EU) 2017/745 including the CE mark and a certificate issued by IMQ S.p.A, NB 0051.;
- **CONTAINER AND SKID-MOUNTED** solutions available;
- Adsorption dryer with dew point controller.

COMPRESSOR TECHNOLOGIES

SCROLL – Oil free

It includes two spiral elements: one moves in eccentric circles and the other one is stationary. Air gets trapped between the two spirals at the suction side and gets transported and compressed to the center of the spiral.
Quiet operation and oil-free air.

RECIPROCATING – Oil free

It includes positive displacement compressors in which the compressing and displacing element is a piston having a reciprocating motion within a cylinder.
Small footprint and oil free air.

ROTARY SCREW

It includes two counter-rotating screws housed in a chamber (air-end). The area containing the air gets increasingly smaller as the air moves along, and the pressure increases.
High-volume, steady stream of compressed air, easy maintenance.

TREATMENT AND CONTROL TECHNOLOGY

The air passes through the air compressor and the adsorption dryer, being stored, afterwards, in a high pressure vessel with a dew point below -40°C.

The cycling mode of the adsorption dryer is controlled by a built-in dew point meter allowing significant energy savings. The **AirSYS M** system is fully automated and controlled by PLC, not requiring any human intervention.

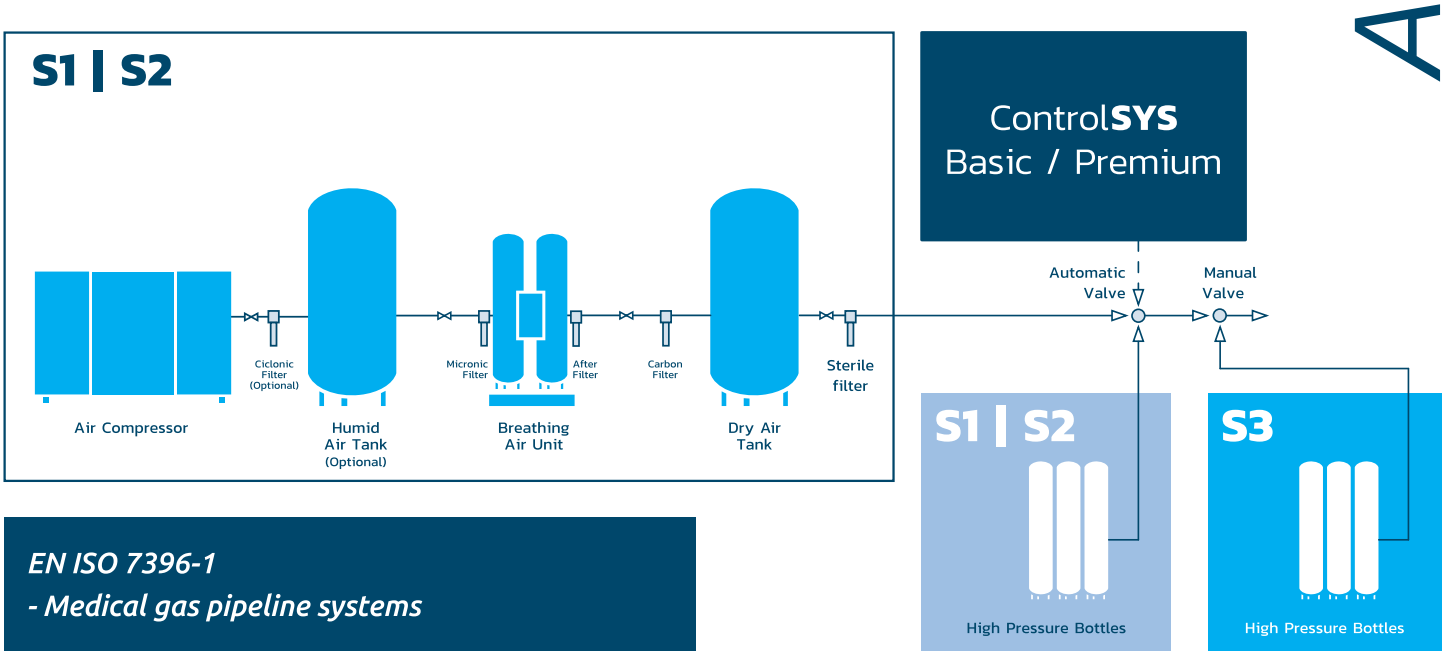
INSTALLATION OPTIONS IN ACCORDANCE WITH THE STANDARD:

POSSIBLE SYSTEM CONFIGURATION OPTIONS:

- **S1** · 1 AirSYS M System + 2 High pressure sources
- **S2** · 2 AirSYS M M Systems + 1 High pressure source
- **S3** · 3 AirSYS M M Systems

THE MEDICAL AIR SUPPLY SYSTEM SHOULD HAVE 3 SOURCES OF SUPPLY: PRIMARY, SECONDARY AND RESERVE.

PRIMARY SOURCE
SECONDARY SOURCE
RESERVE SOURCE



EN ISO 7396-1
- Medical gas pipeline systems

ADVANTAGES OF FULL SYSTEM CERTIFICATION

**** SYSADVANCE designs and installs Medical Air Systems according to Medicinal Air Monograph.***
**** Full system certification includes:***

- Dimentioning and specification;
- Manufacturing;
- Full test and factory validation including mass spectrometer analysis;
- As-built layout and P&ID;
- Installation, start-up and training;
- On-site validation;
- Certified maintenance program;
- Periodic assessment of gas quality.

SYSADVANCE system certification provides health care facilities with Medical Air quality and security of supply under Medicinal Air Monograph requirements.

CE 0051

MODEL	Air Flow	Vessel	Scroll	Screw	Piston
Operating Pressure: 8 barg.	m^3/h	l			
AirSYS M 1	11	250	•		•
AirSYS M 2	16	250	•	•	•
AirSYS M 3	26	250	•	•	
AirSYS M 4	31	250	•	•	
AirSYS M 5	41	500	•	•	
AirSYS M 6	58	500	•	•	
AirSYS M 7	72	500	•	•	
AirSYS M 8	96	500	•	•	
AirSYS M 9	120	500	•	•	
AirSYS M 10	140	750	•	•	
AirSYS M 11	160	750	•	•	
AirSYS M 12	219	1000	•	•	
AirSYS M 13	271	1000	•	•	
AirSYS M 14	286	1500	•	•	
AirSYS M 15	380	1500	•	•	
AirSYS M 16	450	2000	•	•	
AirSYS M 17	560	3000	•	•	
AirSYS M 18	720	3000	•	•	

MEDICAL VACUUM

VACUUMSYSTEM

VACUUMSYS M

DESCRIPTION

VacuumSYS M is a vacuum supply system that, once connected to the health care vacuum pipeline system, provides vacuum to terminal units. It is designed to be easily installed in any indoor facility, requiring only vacuum pumps and a power connection.

It consists mainly of vacuum pumps, bacteriological filters, drainage traps and a system control unit that assures monitoring of all the vacuum pumps, assuring supplying continuity.

VacuumSYS M is an extremely efficient medical vacuum system, allowing continuous availability at a very competitive cost.

VacuumSYS M is intended to be used to provide continuos supply of medical Vacuum to a pipeline system in healthcare facilities.

ADVANTAGES

- **EASY AND QUICK INSTALLATION;**
- **COMPACT SYSTEM;**
- **QUALITY COMPONENTS;**
- **ENERGY EFFICIENT;**
- **INTELLIGENT SWITCH AND ROTATION OF VACUUM PUMPS;**
- **LOCAL AND REMOTE ALARMS;**
- **CERTIFICATION**
  - Certified quality management system according to ISO 13485;
  - Medical devices meet the requirements of regulation (EU) 2017/745 including the CE mark and a certificate issued by IMQ S.p.A, NB 0051.

VACUUM PUMP TECHNOLOGY

ROTARY VANE
– DRY or LUBRICATED

It includes rotary positive displacement.
Pumping system consists of a housing, an eccentrically installed rotor and vanes that move radially, displacing the air from the inlet to the outlet.
Economic, with high ultimate vacuum.

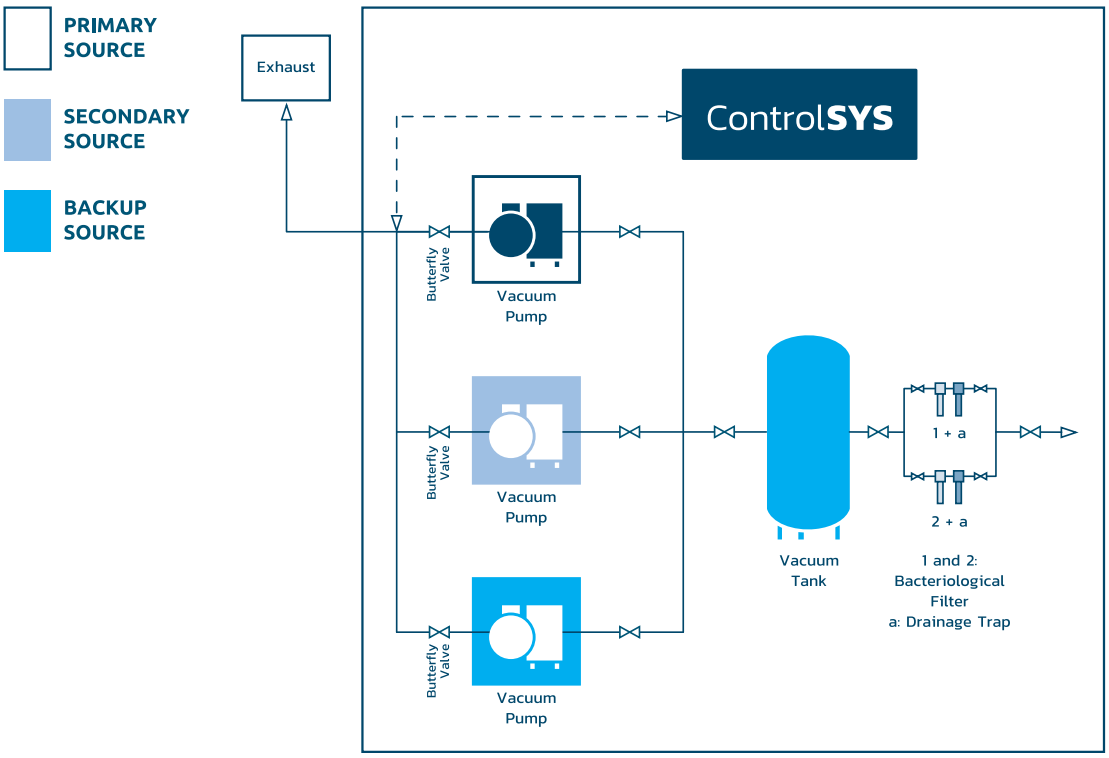
DRY CLAW

It includes two claws turning in opposite directions in a housing, separated from one another by a minimum gap. The intake air is compressed by the special geometrical form of the claws and expelled at the delivery connection on the end.
Low maintenance, high reliability.

CONTROL AND FILTER TECHNOLOGY

- Galvanized vacuum vessel with a wide range of volumes;
- Double filtration – medical vacuum sterile filters with drain jar;
- Fully automated and controlled by PLC;
- Intelligent control system
  - automatic management of vacuum pumps order of operations for an equitable distribution of working hours;
- Local and remote alarms via GPRS (optional).

INSTALLATION OPTIONS IN ACCORDANCE WITH THE STANDARD:



EN ISO 7396-1
- Medical gas pipeline systems

ADVANTAGES OF FULL SYSTEM CERTIFICATION

**** SYSADVANCE designs and installs Vacuum Air Systems to produce according to EN ISO 7396-1, HTM 02-01.***
**** Full system certification includes:***

- Dimentioning and specification;
- Manufacturing;
- Full test and factory validation;
- As-built layout and P&ID;
- Installation, start-up and training;
- On-site validation;
- Certified maintenance program.

CE 0051

MODEL	Pump Capacity	Ultimate Pressure	Nominal Power p/ Pump	Vessel Capacity
	(m^3/h) @ 400 mbar	mbar	kW	l
VacuumSYS 25 M	25	0,1	0,75	250
VacuumSYS 40 M	40	0,1	1,1	250
VacuumSYS 63 M	63	0,1	1,5	500
VacuumSYS 100 M	100	0,1	2,2	500
VacuumSYS 160 M	160	0,1	4,0	1000
VacuumSYS 200 M	200	0,1	4,0	1000
VacuumSYS 250 M	250	0,1	5,5	1000
VacuumSYS 300 M	300	0,1	5,5	2000
VacuumSYS 400 M	400	0,1	11	2000
VacuumSYS 500 M	500	0,1	11	2000
VacuumSYS 9 M Dry	9,0	150	0,37	250
VacuumSYS 14 M Dry	14	150	0,55	250
VacuumSYS 22 M Dry	22	120	0,9	250
VacuumSYS 38 M Dry	38	120	1,25	250
VacuumSYS 55 M Dry	55	60	1,1	500
VacuumSYS 72 M Dry	72	60	1,5	500
VacuumSYS 95 M Dry	95	60	2,2	500
VacuumSYS 125 M Dry	125	60	3,0	500
VacuumSYS 140 M Dry	140	60	3,0	500
VacuumSYS 180 M Dry	180	100	4,0	1000
VacuumSYS 225 M Dry	225	100	4,5	1000
VacuumSYS 270 M Dry	270	150	5,5	1000

MEDICAL OXYGEN, CONTAINER OR SKID MOUNTED

Medical Oxygen is needed all over the world and the struggle to access it in remote places is real, even nowadays. Onsite plants provide security for these remote places or islands in case of transport delays and climatic difficulties.

SYSADVANCE developed container and skid mounted solutions that allow the customer to have a plug & play unit, preventing installation, start-up and operation troubles. The preparation of the site to receive the unit is minimal and all units comply with most common regulations for medical devices, such as ISO 13485, PED (Pressure Equipment Directive) 2014/68/EU and MDR (Medical Devices Regulation) EU 2017/745.
The quality and efficiency of our Medical Oxygen Systems are guaranteed, even in the most extreme conditions:

- Temperatures from –30°C to +55°C;
- Humidity up to 90% RH at 40°C;
- Altitude up to 3.000 m.

SYSADVANCE provides a complete technical file for each container or skid mounted Medical System, with full certification of all package.

GLOBAL PRESENCE

see our Industrial & Energy products

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