

MEDICAL



AIR**SYS M**

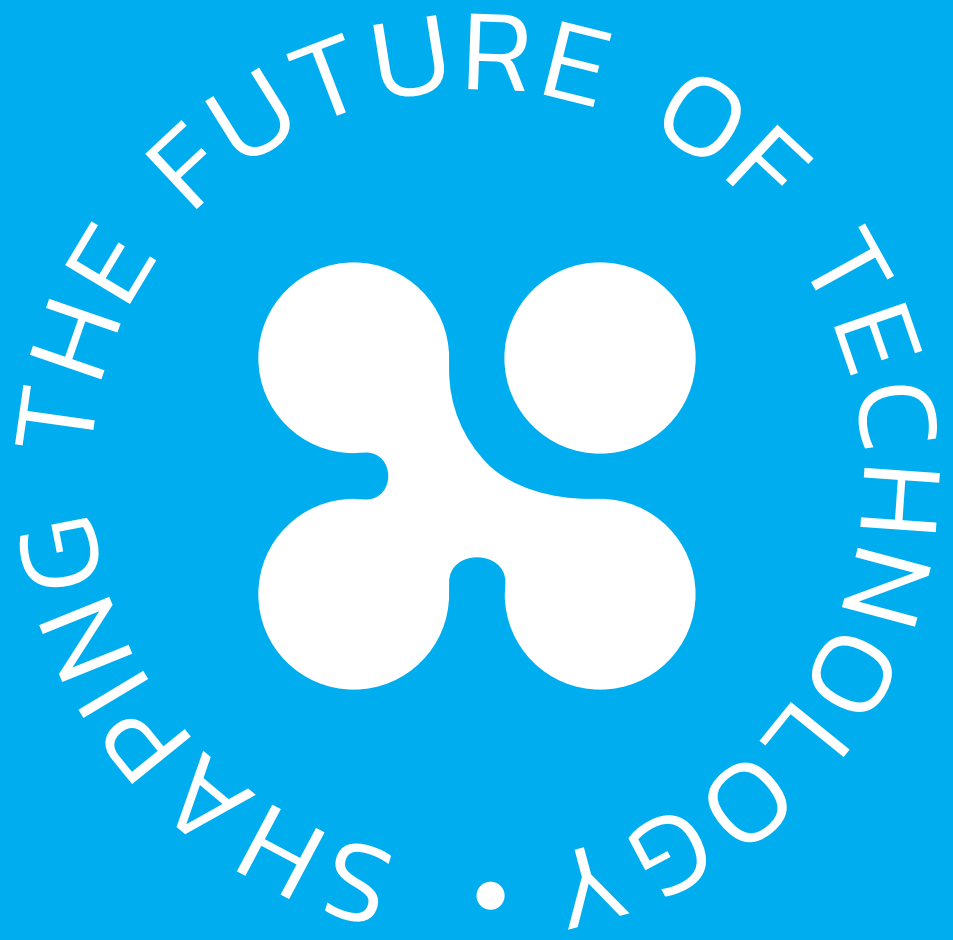


VACUUM**SYS M**

MEDICAL

sysadvance®

EN


SHAPING THE FUTURE OF TECHNOLOGY

sysadvance®

INDEX

04 THE COMPANY

05 PSA TECHNOLOGY

08 MEDICAL OXYGEN • **OXYGEN M SERIES**

14 MEDICAL AIR • **AIRSYS M SERIES**

18 MEDICAL VACUUM • **VACUUMSYS M SERIES**

20 INTEGRATED SOLUTIONS

21 GLOBAL PRESENCE



MD

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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

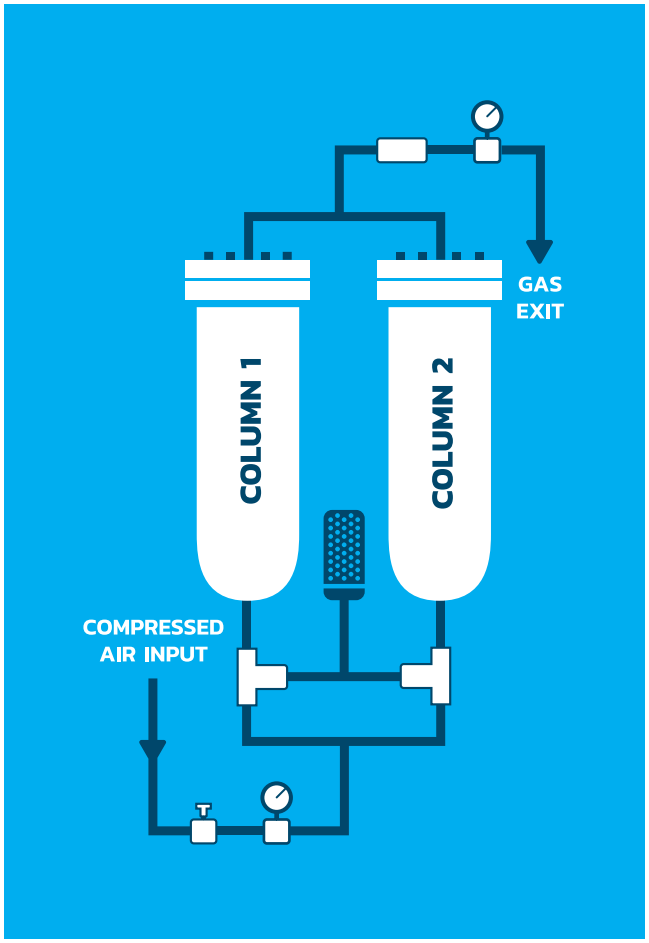
Pressure Swing Adsorption can be used to produce Oxygen from compressed air, which is fed to the unit that uses adsorption phenomena to remove contaminants: H_2O and CO_2 are removed along with other minor contaminants.

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.





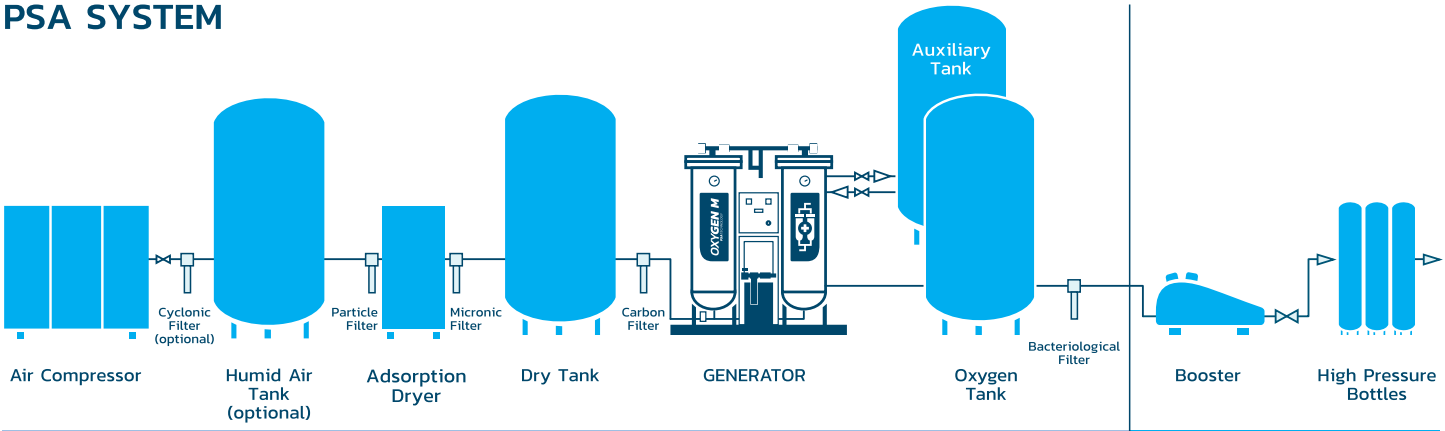
PSA TECHNOLOGY



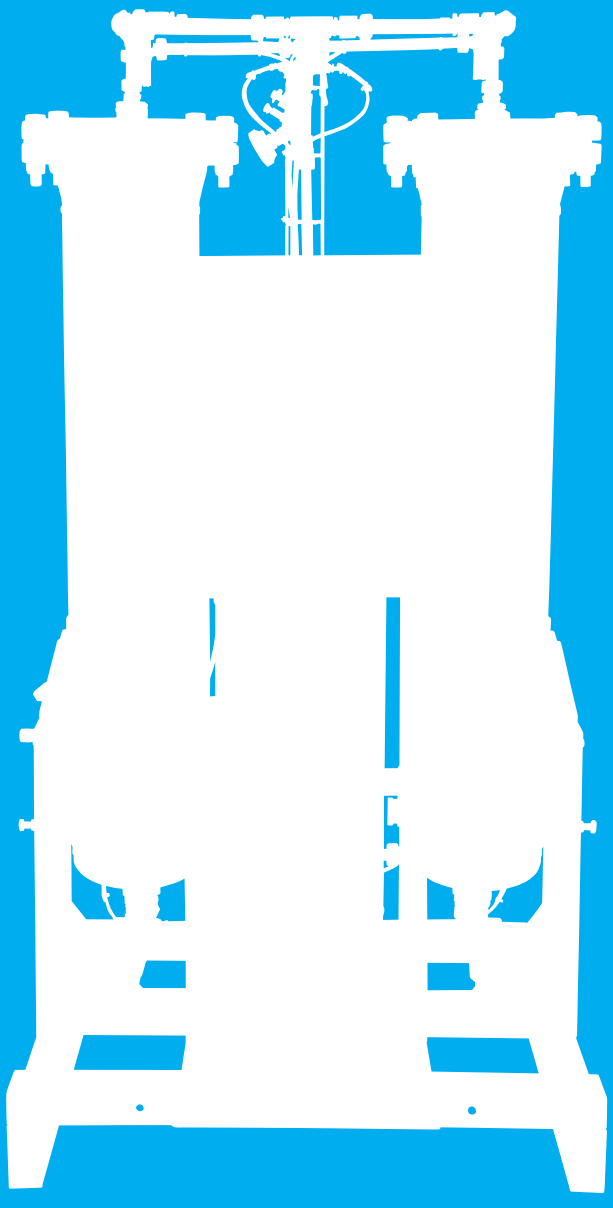
PSA ADVANTAGES

- **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**

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
  - These medical devices comply with the requirements of Directive 93/42/EEC (MDD) and bear the CE marking. Transition to Regulation (EU) 2017/745 (MDR) is currently in progress.
- **CONTAINER AND SKID-MOUNTED** solutions available.

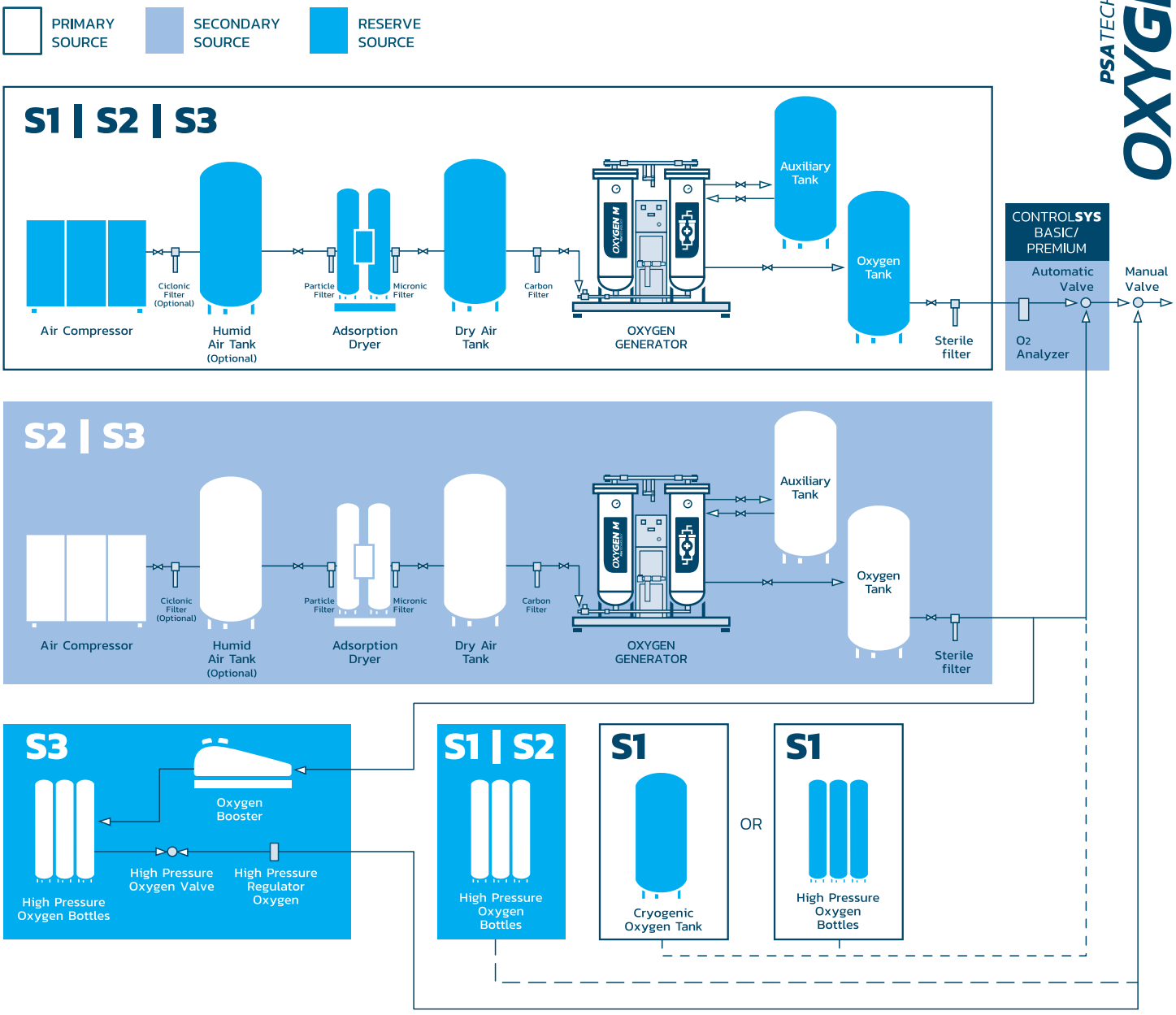


INSTALLATION OPTIONS IN ACCORDANCE WITH THE STANDARD:

POSSIBLE SYSTEM CONFIGURATION OPTIONS:

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

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



ISO 7396-1 – Pipeline systems for compressed medical gases

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

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 Directive 93/42/EEC (transition to Regulation (EU) 2017/745 is currently in progress) 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
- Webserver
- O_2 Sensor (zirconia or paramagnetic)

ADVANCED MONITORING SYSTEM

Features

- Pressure | Purity | Flow rate
- Siemens PLC S7 + 7" touch screen
- Communication mode via Modbus | TCP/IP
- Webserver
- Remote monitoring | SMS alarm | SmartServer
- O_2 Sensor (zirconia or paramagnetic)
- CO | CO_2 | Dew Point Sensors

PERFORMANCE

MODEL	REF.	93%			Air consumption	95%			Air consumption
		Sm³/h	Nl / min	SCFH	Sm³/h	Sm³/h	Nl / min	SCFH	Sm³/h
OXYGEN	10M	1,1	18	38	12	0,9	16	33	12
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

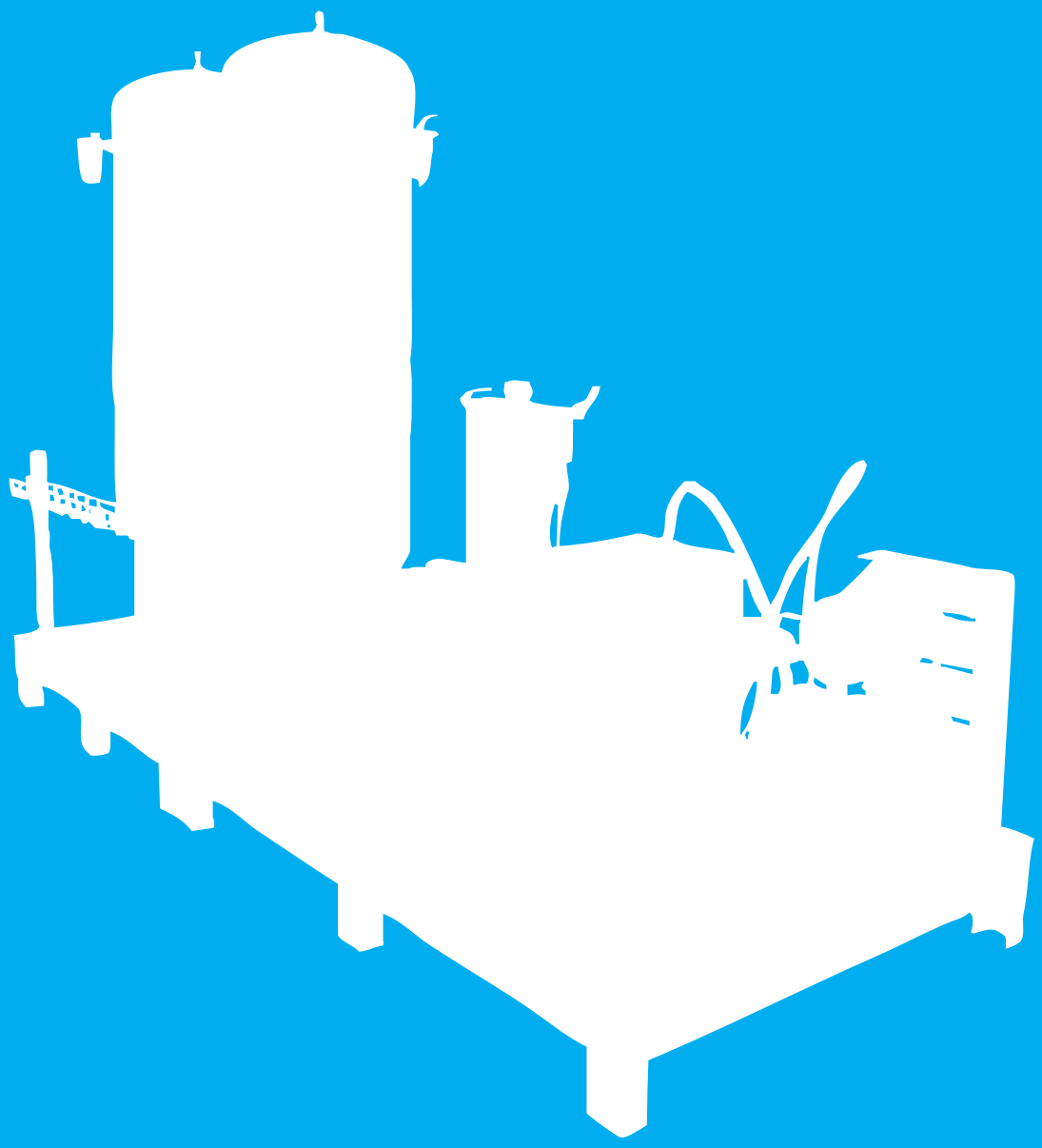


Performance at preference conditions 20°C and 1 bar atmospheric pressure.

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.

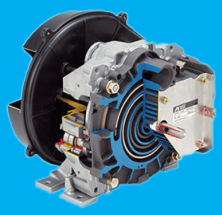
ADVANTAGES

- **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;
  - These medical devices comply with the requirements of Directive 93/42/EEC (MDD) and bear the CE marking. Transition to Regulation (EU) 2017/745 (MDR) is currently in progress.;
- **CONTAINER AND SKID-MOUNTED** solutions available;
- **ADSORPTION DRYER** with dew point controller.

COMPRESSOR TECHNOLOGIES

SCROLL
– Oil free

Oil-free technology using two spiral elements (one fixed, one orbiting) for smooth and quiet compression.
Provides clean, high-purity air, ideal for medicinal applications.



ROTARY SCREW
– Oil lubricated or oil free

High-efficiency compressor with two counter-rotating screws, delivering a continuous and reliable air supply. Available in oil-lubricated and oil-free versions.
In medicinal air systems, advanced treatment and monitoring ensure compliance with European Pharmacopoeia requirements.



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.

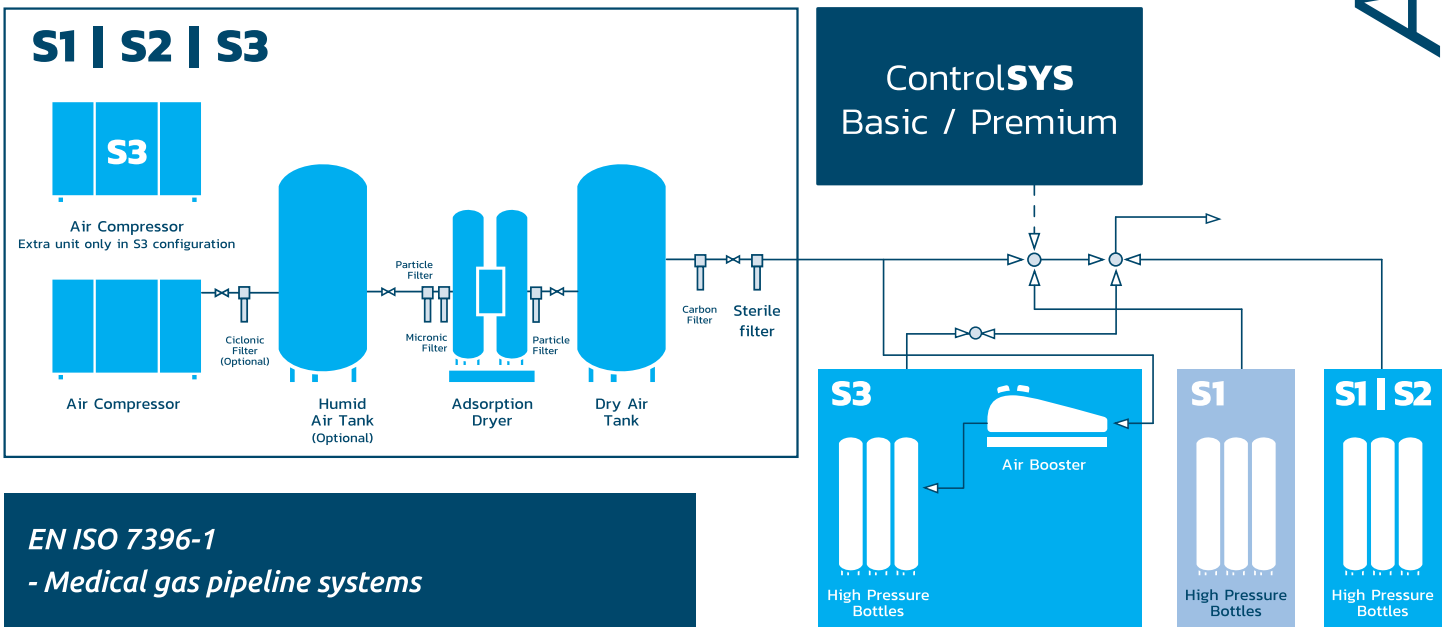
INSTALLATION OPTIONS IN ACCORDANCE WITH THE STANDARD:

POSSIBLE SYSTEM CONFIGURATION OPTIONS:

- **S1** · 1 AirSYS M System + 2 High pressure sources
- **S2** · 2 AirSYS M Systems + 1 High pressure source
- **S3** · 2 AirSYS M Systems + Air booster + 1 High pressure source + 1 Extra compressor

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 quality and secure Medical Air supply under Medicinal Air Monograph requirements.

PERFORMANCE / SPECIFICATIONS

AirSYS M

MODEL	REF.	Air Flow	Vessel (min. capacity)	Screw (lubricated)	Screw (oil free)	Scroll
		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	250	•		•
AirSYS M	6	58	500	•		•
AirSYS M	7	72	500	•		•
AirSYS M	8	96	500	•		
AirSYS M	9	120	500	•		•
AirSYS M	10	140	500	•		
AirSYS M	11	160	1000	•		•
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	•	•	

Operating Pressure: 8 barg.

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.

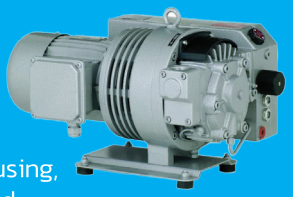
VacuumSYS M is intended to be used to provide continuos supply of medical Vacuum to a pipeline system in healthcare facilities.

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
  - These medical devices comply with the requirements of Directive 93/42/EEC (MDD) and bear the CE marking. Transition to Regulation (EU) 2017/745 (MDR) is currently in progress.

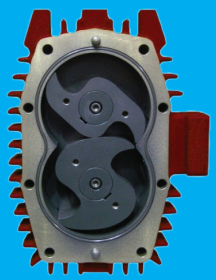
VACUUM PUMP TECHNOLOGY

ROTARY VANE – DRY or LUBRICATED



Rotary positive displacement pumping system consisting of a housing, an eccentrically installed rotor, and radially moving vanes that transfer air from the inlet to the outlet.
Cost-effective and robust solution, capable of achieving high ultimate vacuum levels.

DRY CLAW

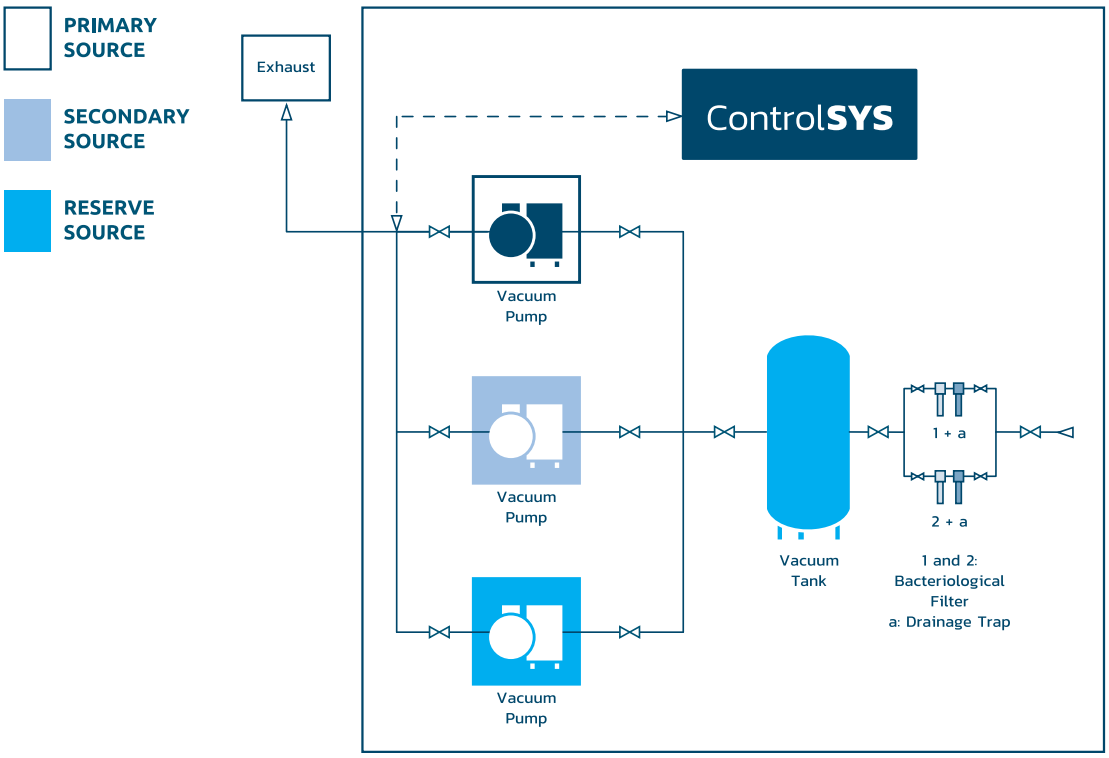


Features two claws rotating in opposite directions within a housing, separated by a minimal gap. The incoming air is compressed by the claw's special geometry and expelled at the outlet connection.
Low maintenance and ideal for demanding medical applications.

CONTROL AND FILTRATION TECHNOLOGIES

- Galvanized tank available in a wide range of volumes;
- Dual filtration: sterile medical vacuum filters with drainage reservoir;
- Fully automated and PLC-controlled;
- Intelligent control system;
- Automatic management of the operating sequence of the 3 pumps for balanced 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.



MODEL	REF.	Max. Pump Capacity	Ultimate Pressure	Nominal Power p/ Pump	Min. Vessel Capacity
		(m^3/h)	mbar	kW	l
VacuumSYS	25M	25	0,1	1,0	250
VacuumSYS	40M	40	0,1	1,4	250
VacuumSYS	63M	63	0,1	2,0	500
VacuumSYS	100M	100	0,1	2,7	500
VacuumSYS	160M	160	0,1	5,5	1000
VacuumSYS	200M	200	0,1	5,5	1000
VacuumSYS	250M	250	0,1	7,5	1000
VacuumSYS	300M	300	0,1	8,3	2000
VacuumSYS	400M	400	0,1	11,0	2000
VacuumSYS	500M	500	0,1	11,0	2000
VacuumSYS	9M Dry	9,0	150	0,37	250
VacuumSYS	14M Dry	14	150	0,55	250
VacuumSYS	22M Dry	22	120	0,9	250
VacuumSYS	38M Dry	38	120	1,25	250
VacuumSYS	55M Dry	55	60	1,3	500
VacuumSYS	72M Dry	72	60	1,8	500
VacuumSYS	95M Dry	95	60	2,8	500
VacuumSYS	125M Dry	125	60	3,5	500
VacuumSYS	140M Dry	140	60	3,0	500
VacuumSYS	180M Dry	180	100	4,2	1000
VacuumSYS	225M Dry	225	100	5,0	1000
VacuumSYS	270M Dry	270	150	6,0	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 and Directive 93/42/EEC (MDD). Transition to Regulation (EU) 2017/745 (MDR) is currently in progress.

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.



INTEGRATED SOLUTIONS

GLOBAL PRESENCE













see our Industrial & Energy products

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