VPSA Technology : Vacuum Pressure Swing Adsorption

Oil-less low pressure compressor to feed the oxygen generator.
No need of air treatment system as for PSA.
No oil pollution.

Set of pneumatic valves developped internally and extremely reliable.

Low maintenance cost due to 100% oil free process from 0,5 bar to 12 bar.

Better Total Cost Ownership comparing to PSA

Pressure/vacuum tanks made in our internal boiler and filled with zeolite lithium basis.

Réf : 520883-01-EN 01/2025

VPSA oxygen generators

Oil-less vacuum pump to regenerate the zeolite and participate to energy saving.

Built-in electrical connections on each machine for plug and play installation.

Oil-less scroll oxygen compressor from 0,5 bar to 6 bar driven by variable frequency converter for energy saving.

Oil-less piston booster from 6 to 12 bar for double stage pressure pipeline.

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PRO$_2$XY® VAC

Our new VPSA generators will give you a technological edge for oxygen on-site production.

VPSA is the acronym for Vacuum Pressure Swing Adsorption.

Vacuum : To help the regeneration / desorption of the molecular sieve
Pressure : To feed the generator molecular sieve
Swing : The steady changeover of production bed
Adsorption : Is based on the ability for porous materials like zeolites to bind gases through their large surface areas.

But it also stands for Innovation :
- No more energy waste to compress nitrogen at several bars.
- Special zeolite with high affinity for water vapor, removing the need of dryer.
- No oil : vacuum pump and blower are oil-less rotary lobe units.

Mil's has drawn from its experience of PSA generators to develop this new concept for reliable production on the hospital site, independent from cylinder or liquid supply.

The adsorption-desorption phenomena described on the next page is similar to the PSA one with its 2 beds systems. However the cycle being carried out at lower pressures, the power consumption will decrease of more than 60% for a constant production of oxygen at 95%.

The new Procom 3 touchscreen panel ensures a trouble free production, with control and record of all the parameters. Paired with the Vigifluid remote monitoring, every connected user can follow and trace back the oxygen quality and events. The synoptic on either screen displays the status of the plant components and also the sensor data required by ISO 7396-1 standard.

Main advantages :
- Fully automatic on-demand production
- Low operating costs
- Modular design
- Data logging and real time trend of events
- Remote monitoring capability

To assist operating and service, the generators are delivered with their full documentation. Multi-level secured access permits a supervisory control of several plants at once. A visual reminder of the maintenance times is also included on the Procom features.
For the commissioning of your plant, Mil's offers comprehensive start-up contracts where a technical specialist performs final arrangement and trains the end users.

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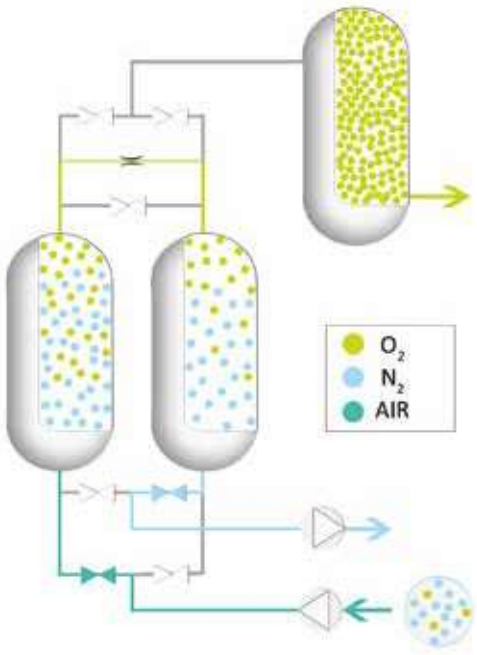
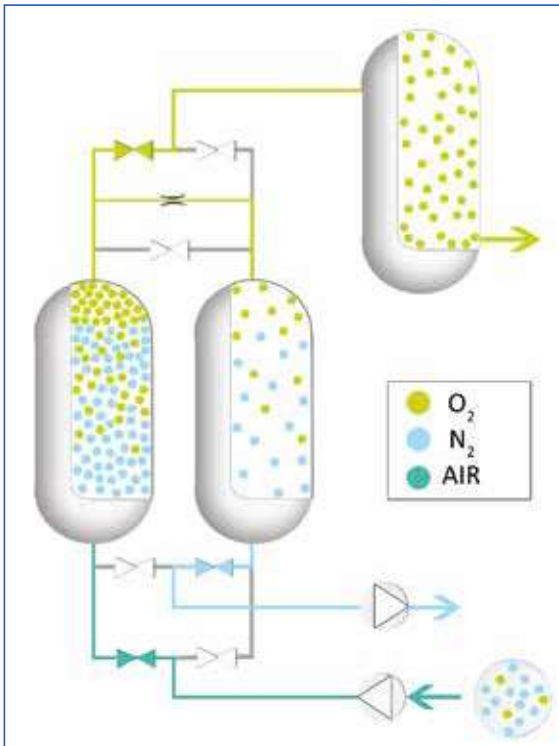
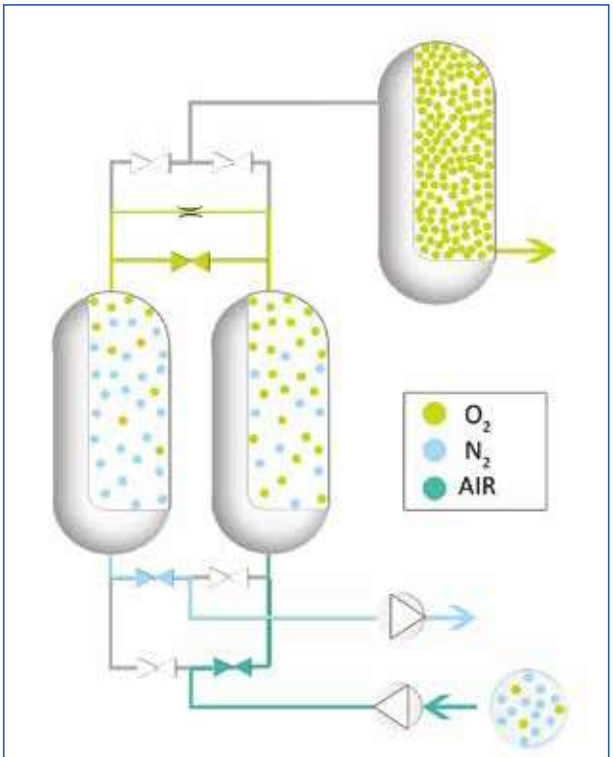
VPSA oxygen generators



1 Pressurization / Start of regeneration



2 Production / regeneration



3 Balancing

PRO$_2$XY® VAC - 5 bar

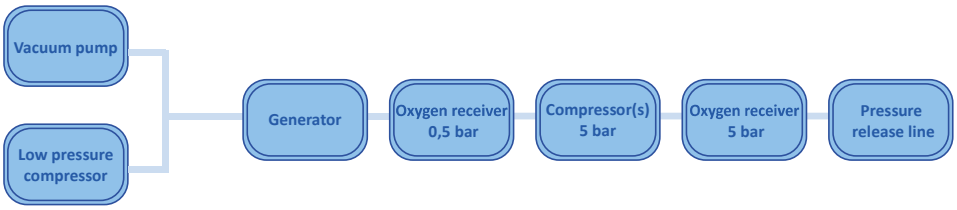
VPSA technology

- Totally oil-less process
- Oxygen purity 95 ± 1% or 93 ± 1%
- VPSA technology with low energy consumption
- Quick starting process, reduced time of 60% comparing to PSA
- Automatic calibration of the oxygen sensor(s) (option)
- Reduced maintenance
- Touch PLC control PROCOM3 developed according to EN62304
- Complies with EN 7396-1: 2016
- Environment-friendly

Characteristics

PRO$_2$XY® VAC 5 bar version	Flow rate m³.h⁻¹ 50 Hz - 20°C			Total installed power kW			Average power consumption - kW		
	90%	93 %	95 %	90%	93 %	95 %	90%	93 %	95 %
PRO$_2$XY® VAC 27	34,6	30	27	23,7	23,7	23,7	16,7	16,3	15,7
PRO$_2$XY® VAC 40	57	50	42	38,8	38,8	34,8	27,4	26,3	24,9

Process sequence



Legend
Pneumatic

1. Oil free low pressure compressor
2. VPSA oxygen generator at 0,5 bar
3. Oil free vacuum pump
4. Buffer tank at 0,5 bar of oxygen
5. 5 bar O_2 compressor
6. 5 bar storage tank of oxygen
7. 5 bar hospital network

HIGH PRESSURE OPTION

8. 200 bar - O_2 high pressure booster
9. Rack of HP cylinders or cylinder manifolds
10. High pressure filling skid for mobile cylinders

Power supply

3-phase, 400V+N+E / 50Hz

CE 0459
Range complying with 93/42/CEE directive

CE 0082
Range complying with 2014/68/UE directive

Réf : 520883-01-EN 01/2025

VPSA oxygen generators

Dimensions (mm)

PRO$_2$XY® VAC 27

PRO$_2$XY® VAC 40

PRO$_2$XY® VAC 5 bar	PRO$_2$XY® VAC 27		PRO$_2$XY® VAC 40	
	Dimensions (mm)	Weight (kg)	Dimensions (mm)	Weight (kg)
1 SRP	1130 x 780 x 1200	300	1130 x 780 x 1200	325
2 PAV	1250 x 970 x 1300	425	1380 x 970 x 1300	475
3 Generator	1525 x 1735 x 2190	1500	1710 x 1835 x 2250	2000

Compression module PRO$_2$XY® VAC 27

Compression module PRO$_2$XY® VAC 40

PRO$_2$XY® VAC 5 bar	PRO$_2$XY® VAC 27 - 93/95 %		PRO$_2$XY® VAC 40 - 93 %		PRO$_2$XY® VAC 40 - 95 %	
	Dimensions (mm)	Weight (kg)	Dimensions (mm)	Weight (kg)	Dimensions (mm)	Weight (kg)
5 Compression module	1276 x 540 x 1273	170	1279 x 1115 x 1475	300	1276 x 540 x 1273	220
4 RT tank	1200 x 880 x 2380 **1000 l**	220	1490 x 1210 x 2520 **2000 l**	395	1490 x 1210 x 2520 **2000 l**	395
6 RP O_2 tank	1000 x 880 x 2380 **1000 l**	220	1400 x 1210 x 2520 **2000 l**	395	1400 x 1210 x 2520 **2000 l**	395

Plant references

PRO$_2$XY® VAC - 5 bar		PRO$_2$XY® VAC 27		PRO$_2$XY® VAC 40	
		93 %	95 %	93 %	95 %
PRO$_2$XY® VAC	Single line	924972	924674	924976	924682
Final filtration	Simple	824211	824211	824217	824217
PRO$_2$XY® VAC	Multi-line A	924973	924675	924977	924683
PRO$_2$XY® VAC	Multi-line B	924974	924676	924978	924684
PRO$_2$XY® VAC	Multi-line C	924975	924677	924979	924685
Final filtration	Duplex	824212	824212	824218	824218

Accessories and option references

O_2 paramagnetic analyzer	manual calibration	724565
O_2 paramagnetic analyzer	automatic calibration	724566
Redundancy box for O_2 analyzer	(EN62304)	724564
Redundancy box for HP	(EN62304)	724752
2nd O_2 paramagnetic analyzer	manual calibration	724627
2nd O_2 paramagnetic analyzer	automatic calibration	724628
O_2 ziconium analyzer	zirconium	625616

O_2 ambient analyzer	622709
O_2 hygrometry sensor	823735
CO KIT analyzer	724912
CO / CO_2 KIT analyzer	724914
O_2 flowmeter G1/2"	624683
24VCC power supply	625004
Energy monitoring - 100A	625090

PRO$_2$XY® VAC - 12 bar

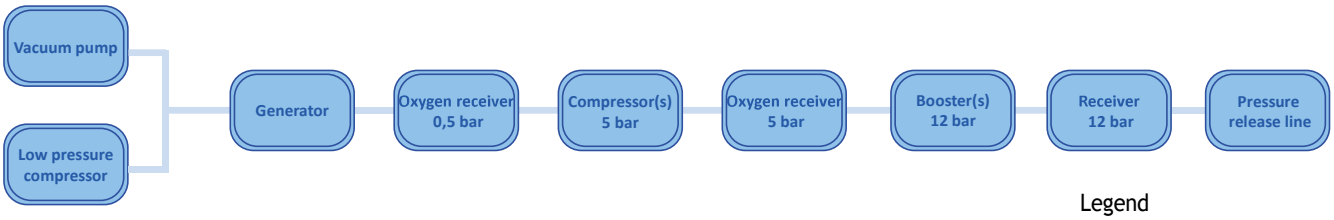
VPSA technology

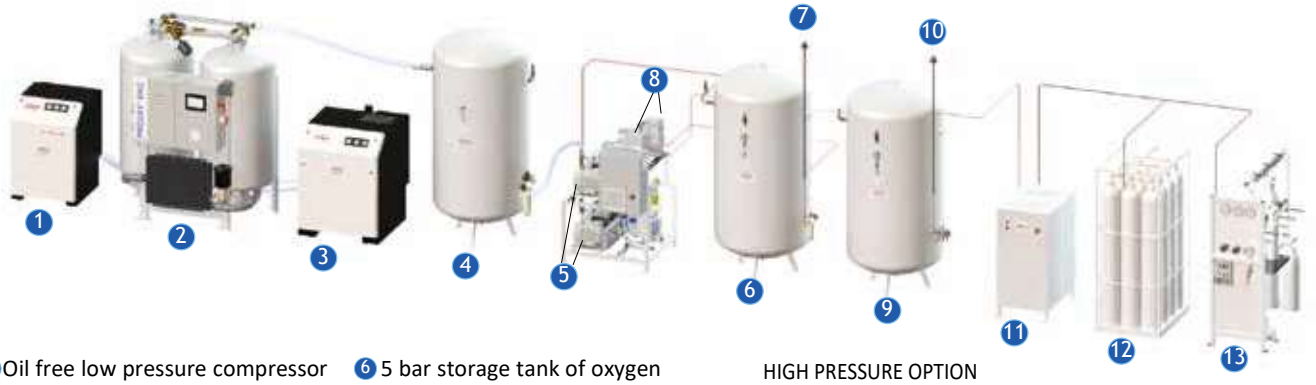
- Totally oil-less process
- Oxygen purity 95 ± 1% or 93 ± 1%
- VPSA technology with low energy consumption
- Quick starting process, reduced time of 60% comparing to PSA
- Automatic calibration of the oxygen sensor(s) (option)
- Reduced maintenance
- Touch PLC control PROCOM3 developed according to EN62304
- Complies with EN 7396-1: 2016
- Environment-friendly

Characteristics

PRO$_2$XY® VAC 12 bar version	Flow rate *m³.h⁻¹ 50 Hz - 20°C			Total installed power kW			Average power consumption - kW		
	90%	93 %	95 %	90%	93 %	95 %	90%	93 %	95 %
PRO$_2$XY® VAC 27	34,6	30	27	26,7	26	26	17,7	17,1	16,6
PRO$_2$XY® VAC 40	57	50	42	43,3	42,6	38,6	29,8	28,3	27,1

Process sequence





1. Oil free low pressure compressor
2. VPSA oxygen generator at 0,5 bar
3. Oil free vacuum pump
4. Buffer tank at 0,5 bar of oxygen
5. 5 bar O_2 compressor
6. 5 bar storage tank of oxygen
7. 5 bar hospital network
8. 12 bar O2 booster
9. 12 bar storage tank of oxygen
10. 12 bar hospital network

HIGH PRESSURE OPTION

11. 200 bar - O2 high pressure booster
12. Rack of HP cylinders or cylinder manifolds
13. High pressure filling skid for mobile cylinders

Power supply

3-phase, 400V+N+E / 50Hz

CE 0459
Range complying with 93/42/CEE directive

CE 0082
Range complying with 2014/68/UE directive

Réf : 520883-01-EN 01/2025

VPSA oxygen generators

Dimensions (mm)

PRO$_2$XY® VAC 27

PRO$_2$XY® VAC 40

PRO$_2$XY® VAC 12 bar	PRO$_2$XY® VAC 27		PRO$_2$XY® VAC 40	
	Dimensions (mm)	Weight (kg)	Dimensions (mm)	Weight (kg)
1 SRP	1130 x 780 x 1200	300	1130 x 780 x 1200	325
2 PAV	1200 x 970 x 1300	425	1380 x 970 x 1300	475
3 Generator	1525 x 1735 x 2190	1500	1710 x 1835 x 2250	2000

Compression module PRO$_2$XY® VAC 27

Compression module PRO$_2$XY® VAC 40

PRO$_2$XY® VAC 12 bar	PRO$_2$XY® VAC 27 - 93/95 %		PRO$_2$XY® VAC 40 - 93 %		PRO$_2$XY® VAC 40 - 95 %	
	Dimensions (mm)	Weight (kg)	Dimensions (mm)	Weight (kg)	Dimensions (mm)	Weight (kg)
5 Compression module	1279 x 1060 x 1273	280	1279 x 1115 x 1620	410	1279 x 1060 x 1620	330
4 RT tank	1200 x 880 x 2380 **1000 l**	220	1490 x 1210 x 2520 **2000 l**	395	1490 x 1210 x 2520 **2000 l**	395
6 RP O_2 tank	1000 x 880 x 2380 **1000 l**	220	1400 x 1210 x 2520 **2000 l**	395	1400 x 1210 x 2520 **2000 l**	395
7 R 1O tank	970 x 880 x 2380 **1000 l**	220	1410 x 1210 x 2520 **2000 l**	395	1410 x 1210 x 2520 **2000 l**	395

Plant references

PRO$_2$XY® VAC - 12 bar		PRO$_2$XY® VAC 27		PRO$_2$XY® VAC 40	
		93 %	95 %	93 %	95 %
PRO$_2$XY® VAC	Single line	924980	924678	924984	924686
Pressure release line	Simple	824214	824214	824214	824214
PRO$_2$XY® VAC	Multi-line A	924981	924679	924985	924687
PRO$_2$XY® VAC	Multi-line B	924982	924680	924986	924688
PRO$_2$XY® VAC	Multi-line C	924983	924681	924987	924689
Pressure release line	Duplex	824215	824215	824215	824215

Accessories and option references

O_2 paramagnetic analyzer	manual calibration	724565
O_2 paramagnetic analyzer	automatic calibration	724566
Redundancy box for O_2 analyzer	(EN62304)	724564
Redundancy box for HP	(EN62304)	724752
2nd O_2 paramagnetic analyzer	manual calibration	724627
2nd O_2 paramagnetic analyzer	automatic calibration	724628
O_2 probe analyzer kit	zirconium	625616

O_2 ambient analyzer	622709
O_2 hygrometry monitoring kit	823735
CO KIT analyzer	724912
CO / CO_2 KIT analyzer	724914
O_2 flowmeter G1/2"	624683
Power supply 24VCC	625004
Energy monitoring - 100A	625090