xebec

A world powered by clean energy

N2XSOLUTIONS

ON SITE NITROGEN

for a range of applications, including

- Food & Beverage
- Laser
- Chemical
- Metal & Glass Processing
- Electronics
- Pharmaceutical
- Oil & Gas Extraction
- Aviation

Nitrogen Generation

www.xebecinc.com

Nitrogen Generation

Nitrogen (N_2) is a dry, inert, colourless, odourless gas. It is commonly used in a wide range of industry applications because it prevents both fast and slow oxidization.

Blanketing

Due to its low reactivity, nitrogen is an excellent blanketing gas. Blanketing protects a product from the environment or vice-versa. Blanketing is a common practice in the chemical, food, pharmaceutical, oil and gas, glass and metallurgical industries.

Modified Atmosphere Packing (MAP)

The presence of oxygen inside packaged foods and beverages promotes bacterial growth and oxidation, compromising quality and shelf life. By flushing packaged foods with high purity nitrogen, oxygen levels can be reduced to below 1%. This technique is increasingly popular and represents an easy and economical way to protect product and improve package integrity.

Metal Processing

A number of high temperature metallurgical processes are affected by contact with oxygen which favours the formation of oxides. By using nitrogen to minimize the oxygen contact, quality and operating cost can be optimized.

Electronics

The presence of oxygen and water vapour during electronic processing and packing can also lead to the formation of oxides which compromises yield and quality. Nitrogen is used to create inert areas around the process and soldering chambers.

Oil and Gas Extraction

Inert gases such as nitrogen are commonly used in the oil and gas industry for gas lift. High pressure gases like nitrogen are injected into the tubing in order to reduce the density of the fluids. This allows for a reduction of flowing bottom hole pressure (BHP). Nitrogen is also used during electrical generation for blanketing the seals on natural gas compressors.

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Canada Toll Free: 1-877-469-3232 | **Canada Fax:** (450) 979-7869 | **USA Toll Free:** 1-866-622-9100 | **USA Fax:** (832) 532-8746
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Canadian-Made. Fully CRN & ASME - Certified.

Traditionally, nitrogen has been produced by cryogenic distillation and commercialized in the form of bulk liquid and high pressure compressed gas cylinders.

Nowadays, vendor price increases, long term contracts, rental fees, have motivated the development of more efficient and cost effective technologies for on-site generation of nitrogen using pressure swing adsorption (PSA) and membrane systems. Depending on required flow and purity, both can be far more cost-effective than bulk or high pressure cylinder sources.

On site equipment is the right choice. Choosing Xebec equipment is the smart choice.

A global leader in adsorption technology, Xebec is a Canadian company with CRN-certified and CSA-approved PSA and Membrane Nitrogen Generators. The units can be supplied as individual components to your existing system or packaged in a compact, skid-mounted system with everything you need from air compressor to nitrogen storage.

CRN ASME nqa ISO 9001 Registered CSA

Benefits

- ✓ No need for vendors — you are your own supplier
- ✓ Adjustable flow and purity — from 95% to 99.999%
- ✓ Lower production and maintenance costs
- ✓ Cost savings following payback of up to 90%
- ✓ Transport costs are eliminated
- ✓ Continuous operation — you only produce what you consume
- ✓ Easy to install and operate — turnkey systems
- ✓ Modular and compact — easy to gradually increase capacity as required
- ✓ Less energy intensive than cryogenic distillation — environmentally friendly
- ✓ Reliable and safe operation — storage and handling of HP cylinders is eliminated

N2X Membrane Nitrogen Generator

N2X PSA Nitrogen Generator

On-Site N2X Nitrogen Generation System

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Nitrogen System Components

An on-site nitrogen generation system includes compression and pre-treatment units followed by an O_2 removal step which is performed by either a pressure swing adsorption (PSA) unit or a membrane system, depending on flow and purity requirements.

Nitrogen Generation System Using Refrigerant Drying and Membrane Technology — 99.0% Purity

Compressor with After-cooler | Refrigerant Dryer | Water Separator | Air Receiver | XL-F, SF + AC Filters or Activated Carbon Tower | XL-G Filter | Membrane Nitrogen Generator | XL-SF Filter | Nitrogen Receiver

See available options on Page 14

Nitrogen Generation System Using Refrigerant Drying and PSA Technology — 95.0 to 99.5% Purity*

Compressor with After-cooler | Refrigerant Dryer | Water Separator | Air Receiver | XL-F, SF + AC Filters or Activated Carbon Tower | XL-G Filter | PSA Nitrogen Generator | XL-SF Filter | Nitrogen Receiver

See available options on Page 14

Nitrogen Generation System Using Desiccant Drying and PSA Technology — 95.0 to 99.999% Purity*

Compressor Package contains an After-cooler, + Water Separator | XL-SF Filter | Desiccant Air Dryer + G Filter | Air Receiver | XL-AC Filter | PSA Nitrogen Generator | XL-SF Filter | Nitrogen Receiver

See available options on Page 14

***Up to 99.999% Nitrogen Purity with Xebec's proprietary, integrated oxygen removal and drying PSA technology**

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From Air to 99.999% Pure Nitrogen

STEP 1: Air Compression & Pre-Treatment

Atmospheric air must be compressed and treated to remove impurities before it enters the O_2 removal process. Impurities include dust particles, traces of oil and VOCs compounds, low concentrations (parts per million) of CO_2, CO, and water.

Oil-injected air compressors or oil-free compressors are used to pressurize atmospheric air. High humidity levels can compromise membranes and PSA performance; so, after compression, moisture levels are reduced using a refrigerant or desiccant dryer. When using refrigerant drying, condensate water is removed using a coalescing filter which also removes oil aerosols to 0.1 ppm and particles > 1µm. Condensate is eliminated from the system through an automatic drain. The gas is then reheated to about 68°F/20°C and passed through a combination of filters for dust and oil removal. In the case of desiccant dryers, adsorbed moisture is released into the exhaust stream from the dryer, and the dried air is passed through a particulate filter to remove particles > 1µm.

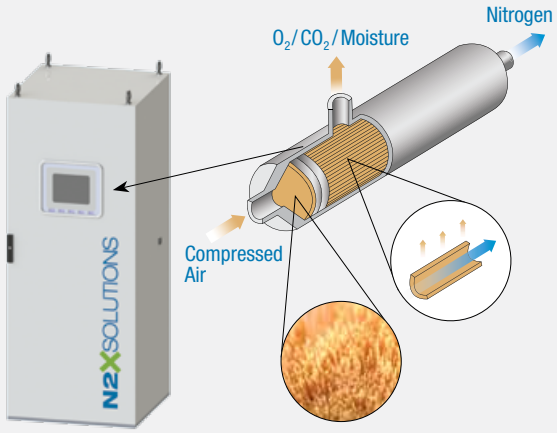
STEP 2: Dust & Oil Removal

Dry compressed air is sent to an air receiver which reduces process fluctuations and guarantees smooth operation of the compressed air system and the O_2 removal system. High efficiency coalescing filters are used to remove moisture and oil aerosols to 0.01 ppm and particles > 0.01µm. An activated carbon filter or tower is used for oil vapours and hydrocarbon odour removal to 0.003 ppm. At this point, the compressed air complies with ISO 8573.1 Class 1.4.1. When refrigerant dryers are used, or Class 1.1.1. when desiccant dryers are used.

STEP 3: O_2 Removal

Nitrogen generation from air is accomplished by removal of O_2. Depending on the required flow, purity and pressure, Xebec has two technologies — PSA and membranes — to concentrate nitrogen from air, adjustable from 95% to 99.999% purity.

Xebec's PSA Nitrogen Generator — N2XP



Xebec's Membrane Nitrogen Generator — N2XM

Pressure Swing Adsorption (PSA)

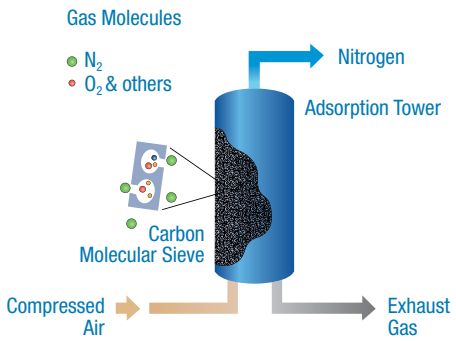
PSA technology is a simple, cost-effective method where atmospheric air is pressurized (50-140 psig/3-9 barg), and then fed into a vessel filled with adsorbents like carbon molecular sieves (CMS).

High N_2 Rates

Xebec's N2X™ solution with PSA works under the principle of adsorption equilibrium and kinetic theory. Xebec's kinetic adsorbent is highly selective to components such as O_2, CO_2 and water vapour, while allowing nitrogen molecules to pass through the adsorbent bed. O_2, CO_2, and CO molecules easily diffuse inside the adsorbent pores when the bed pressurizes (adsorption). Nitrogen molecules, which have a larger diameter in comparison, cannot diffuse inside. The result is a purified nitrogen stream in the product. When depressurized (desorption), the adsorbed impurities are released through the exhaust port.

Xebec PSA units consist of two identical beds filled with proprietary CMS adsorbents, connected together. Compressed air feed enters the bottom of the first vessel. As O_2, CO_2, water vapour and other trace contaminants stick to the adsorbents, the product stream leaves from the top of the vessel. When the adsorbent bed reaches the saturation point, it depressurizes and lets the desorbed gases move to the second vessel (equalization) at an intermediate pressure. This allows for a continuous production flow of nitrogen.

Adsorption Process



Proprietary Carbon Molecular Sieve (CMS)

Green Energy

The nitrogen product dew point is about -58°F/-50°C at atmospheric conditions. The PSA system uses no process water or chemicals for gas purification and generates no wastewater in the exhaust stream. It operates at ambient temperatures of 40 to 104°F/5 to 40°C, and the design pressure is 150 psig/10 barg.

Adjustable Flow and Purity — from 95% to 99.999%

Xebec offers 22 standard N2X™ PSA units. Sizes are a function of the required product flow rate, purity, temperature and pressure. All are suitable for use on-site and equipped with all the components necessary to concentrate nitrogen from air. Depending on size, Xebec PSA units can be installed inside cabinets, or can be set as skid mounted or containerized solutions.

A Stand Alone PSA Unit. Or a fully integrated system. The choice is yours.

Choose a PSA unit and take charge of your own system integration. Choose any number of available options added to the PSA. Or, choose a completely integrated system, skid-mounted and ready to install.

Xebec's PSA Nitrogen Generator — N2XP

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Low Air/N_2 Ratio

N_2 Output Design Capacity Table
PSA Nitrogen Generators

N_2 Output Design Capacity (at design basis conditions)																				
Model	**SCFM**	**NCMH**	**SCFM**	**NCMH**	**SCFM**	**NCMH**	**SCFM**	**NCMH**	**SCFM**	**NCMH**	**SCFM**	**NCMH**	**SCFM**	**NCMH**	**SCFM**	**NCMH**	**SCFM**	**NCMH**	**SCFM**	**NCMH**
	95%		96%		97%		98%		99%		99.5%		99.9%		99.95%		99.99%		99.999%	
N2XP-3	3	4	2	4	2	3	2	3	1	2	1	2	1	2	1	1	1	1	0	1
N2XP-6	6	10	6	9	5	8	4	7	3	6	3	5	2	4	2	3	1	2	1	1
N2XP-9	9	14	8	13	7	11	6	10	5	8	4	7	3	5	3	4	2	3	1	2
N2XP-16	16	26	14	23	13	21	11	18	9	14	8	13	6	9	5	8	4	6	2	3
N2XP-22	22	36	20	33	18	29	16	25	12	20	11	18	8	13	7	11	5	8	3	4
N2XP-26	26	43	24	39	21	34	19	30	15	24	13	21	9	15	8	13	6	10	3	5
N2XP-33	33	53	30	48	26	42	23	37	18	29	16	26	12	19	10	16	8	12	4	6
N2XP-50	50	80	45	73	40	64	35	56	28	45	24	39	18	28	15	25	12	19	6	9
N2XP-63	63	102	57	93	51	82	44	71	35	57	31	50	22	36	20	32	15	24	7	12
N2XP-81	81	131	74	120	65	106	57	92	45	73	40	64	29	47	25	41	19	31	10	15
N2XP-102	102	164	93	150	82	132	71	115	57	91	50	80	36	58	32	51	24	38	12	19
N2XP-149	149	241	136	220	120	194	105	169	83	134	73	118	53	86	46	75	35	56	17	28
N2XP-215	215	347	196	317	173	279	151	243	120	193	105	170	72	115	67	108	50	81	25	41
N2XP-258	258	417	236	380	207	335	181	292	144	232	126	204	92	148	80	129	53	86	30	49
N2XP-301	301	486	275	443	242	390	211	340	168	270	147	238	107	173	93	151	70	113	35	57
N2XP-352	352	567	321	517	282	455	246	397	195	315	172	278	125	202	109	176	82	132	41	66
N2XP-410	410	662	374	604	329	531	287	463	228	368	201	324	146	235	127	205	95	154	48	77
N2XP-471	471	760	429	693	378	610	330	532	262	422	231	372	167	270	146	236	109	176	55	89
N2XP-581	581	938	530	855	467	753	407	656	323	521	285	459	207	333	180	291	135	218	68	110
N2XP-678	678	1094	618	997	545	878	475	766	377	608	332	535	208	335	210	339	157	254	79	128
N2XP-1099	1099	1772	1002	1616	882	1423	769	1241	611	985	538	868	391	630	341	550	255	411	128	207
N2XP-1420	1420	2290	1295	2088	1140	1839	994	1603	789	1273	695	1121	505	814	441	711	329	531	166	268
Air/N_2 Ratio	1.9		1.9		2.0		2.2		2.4		2.6		3.2		3.5		4.3		6.4	

Specifications listed above are typical values. Each PSA will be sized on a case by case basis according to customer process requirements. Capacity calculations are at design basis conditions.

Design Basis
PSA Generators

Design Basis	
Standard Conditions - Temperature and Pressure	60°F/16°C - 1 atm
Normal Conditions - Temperature and Pressure	32°F/10°C - 1 atm
Inlet Compressed Air Temperature	68°F/20°C
Adsorption Pressure	109 psig/7.5 barg
Nitrogen Outlet Pressure	Up to 103 psig/7.1 barg
Minimum Compressed Air Inlet Quality	ISO 8573-1 Class 1-4-1

Flexible Pressure and Temperature Range

Correction Factors

PSA Nitrogen Generators

Multiply Nitrogen Flow by Correction Factor — $K_{N_2}T$											
Adsorption Temperature		95%	96%	97%	98%	99%	99.50%	99.90%	99.95%	99.99%	99.999%
°F	°C										
59	15	0.98	0.98	0.98	0.98	0.97	1.0	1.0	1.0	1.0	1.0
68	20	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
77	25	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
86	30	0.98	1.0	1.0	1.0	1.0	1.0	1.0	0.97	0.96	0.96
95	35	0.94	0.95	0.95	0.95	0.95	0.93	0.93	0.91	0.88	0.87
104	40	0.87	0.88	0.88	0.88	0.89	0.87	0.87	0.84	0.8	0.79
113	45	0.8	0.81	0.81	0.81	0.82	0.8	0.8	0.77	0.71	0.7

Multiply Air/N_2 Ratio by Correction Factor — $K_{Air/N_2}T$											
Adsorption Temperature		95%	96%	97%	98%	99%	99.50%	99.90%	99.95%	99.99%	99.999%
°F	°C										
59	15	0.99	0.98	0.98	1.0	1.0	1.0	1.0	1.0	1.0	1.0
68	20	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
77	25	1.02	1.01	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
86	30	1.04	1.05	1.05	1.07	1.07	1.07	1.08	1.08	1.08	1.09
95	35	1.06	1.07	1.07	1.07	1.07	1.1	1.11	1.12	1.14	1.14
104	40	1.09	1.1	1.11	1.12	1.13	1.16	1.18	1.21	1.27	1.29
113	45	1.11	1.13	1.15	1.17	1.18	1.22	1.25	1.3	1.4	1.43

Multiply Nitrogen Flow/Air/N_2 Ratio by Correction Factor — $K_{N_2}P/K_{Air/N_2}P$							
Adsorption Pressure		$K_{N_2}P$			$K_{Air/N_2}P$		
psig	barg	<99%	99-99.99%	>99.99%	<99%	99-99.99%	>99.99%
44	3.0	0.36	0.37	0.38	1.2	1.19	1.18
58	4.0	0.53	0.53	0.55	1.1	1.09	1.08
73	5.1	0.67	0.68	0.71	1.04	1.03	1.02
80	5.5	0.74	0.75	0.78	1.04	1.0	1.0
87	6.0	0.82	0.82	0.86	1.01	1.0	0.98
93	6.4	0.87	0.88	0.9	1.0	1.0	0.98
102	7.0	0.93	0.94	0.96	1.0	1.0	0.98
109	7.5	1.0	1.0	1.0	1.0	1.0	1.0
116	8.0	1.07	1.06	1.04	1.0	1.0	1.02
131	9.0	1.16	1.14	1.1	1.0	1.0	1.05

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Modular Design. Compact Footprint.

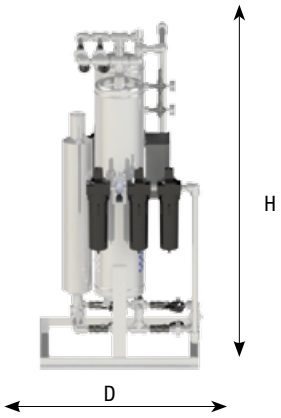
Sizing Examples
PSA Nitrogen Generators

Sizing Example	
NTXP-581 system @ 99%, 6 barg, 35°C:	
Nitrogen flow at design basis conditions **= 521 NCMH**	Air/N_2 Ratio at design basis conditions = 2.4
For 35°C and 6 barg: $K_{N_2}T = 0.95$ I $K_{N_2}P = 0.82$	For 35°C and 6 barg: $K_{Air/N_2}T = 1.07$ I $K_{Air/N_2}P = 1.0$
Nitrogen Flow = 521 NCMH x 0.95 x 0.82 **= 406 NCMH**	Inlet Air Flow = 406 NCMH x 2.4 x 1.07 x 1.0 **= 1053 NCMH**

Technical Specifications
PSA Nitrogen Generators

Model	Connections			Dimensions						Weight	
	Air Inlet	Nitrogen Outlet	Exhaust Outlet	Height		Width		Depth			
				mm	in	mm	in	mm	in	kg	lbs
N2XP-3	3/8"	1/4"	3/8"	1016	40	457	18	356	14	44	100
N2XP-6	1/2"	3/8"	3/4"	1600	63	737	29	610	24	67	150
N2XP-9	1/2"	1/2"	3/4"	1524	60	914	36	711	28	111	250
N2XP-16	3/4"	1/2"	1"	1626	64	978	39	711	28	169	380
N2XP-22	1"	3/4"	1"	2032	80	978	39	711	28	200	450
N2XP-26	1"	3/4"	1.5"	1676	66	991	39	711	28	231	520
N2XP-33	1"	1"	1.5"	2083	82	1118	44	787	31	244	550
N2XP-50	1.5"	1"	1.5"	1803	71	1245	49	889	35	288	650
N2XP-63	1.5"	1"	1.5"	2134	84	1372	54	914	36	346	780
N2XP-81	1.5"	1.5"	2"	1905	75	1448	57	1067	42	586	1320
N2XP-102	1.5"	1.5"	2"	2159	85	1473	58	1067	42	665	1500
N2XP-149	2"	1.5"	2.5"	2845	112	1829	72	1321	52	932	2100
N2XP-215	2"	2"	2.5"	2845	112	1880	74	1321	52	1198	2700
N2XP-258	2.5"	2"	3"	3150	124	1880	74	1321	52	1331	3000
N2XP-301	2.5"	2"	3"	3048	120	2184	86	1321	52	1597	3600
N2XP-352	2.5"	2"	3"	3075	121	2206	87	1472	58	1909	4200
N2XP-410	3"	2.5"	3"	3172	125	2305	91	1529	60	2182	4800
N2XP-471	3"	2.5"	4"	3262	128	2398	94	1583	62	2500	5500
N2XP-581	3"	2.5"	4"	3403	134	2547	100	1668	66	3068	6750
N2XP-678	4"	3"	4"	3511	138	2662	105	1733	68	3568	7850
N2XP-1099	4"	3"	5"	3870	152	3056	120	1954	77	5727	12600
N2XP-1420	5"	4"	5"	4075	160	3288	129	2083	82	7364	16200

Xebec reserves the right to change the design and/or dimensions and/or weight at any time without any notice or liability.



High Performance Membrane Technology

When required nitrogen purity is lower than 99% and the product stream must be delivered at higher pressures (about 175 psig/12 barg), Xebec's high-performance, hollow fiber polymer membrane solution is recommended.

High N_2 Rates

Membrane separation is based on the difference between the permeation rates of various gas molecules through the membrane's microscopic pores. When pressurized air feed enters the membrane modules, O_2, CO_2, water and other gases have a much stronger preference to diffuse and permeate through the membrane than N_2 molecules.

Adjustable Flow and Purity — from 95% to 99%

Membrane technology has the flexibility to produce product gas streams with different nitrogen contents, from 95% to 99%. Following the upgrading process, the nitrogen product is already dry and has a dew-point of about -58°F/-50°C at atmospheric conditions. Membrane technology is easily scalable; it can be used for small plants (< than 10 NCMH) as well as larger ones (several hundred to several thousand NCMH).

Green Energy

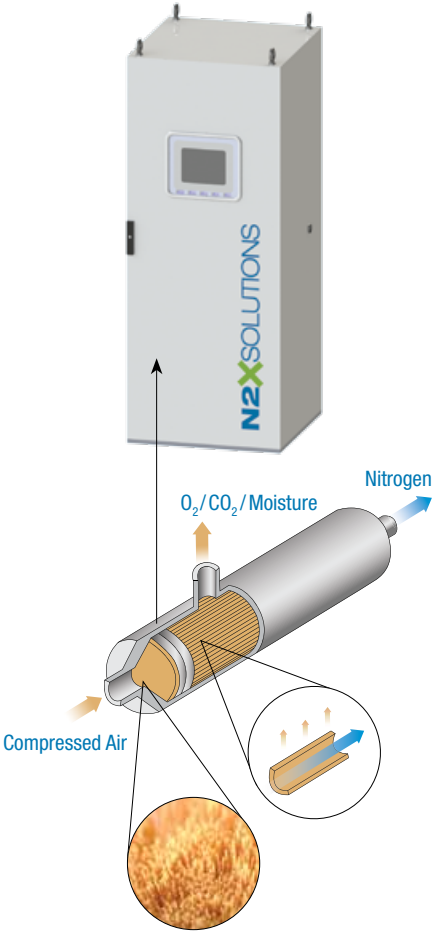
The membrane system uses no process water or chemicals for gas purification and generates no wastewater in the exhaust stream. It operates at ambient temperatures of 40 to 104°F/5 to 40°C, with a design pressure of 200 psig/14 barg.

Xebec offers 11 standard N2X™ membrane units. Sizes are a function of the required product flow rate and purity, temperature and pressure. All are suitable for use on-site and equipped with all the components necessary to concentrate nitrogen from air. Depending on size, Xebec membrane nitrogen generators can be installed inside cabinets, or can be set as skid mounted or containerized solutions.

A Stand Alone Membrane Unit. Or a fully integrated system. The choice is yours.

Choose a Membrane unit and take charge of your own system integration. Choose any number of available options added to the Membrane unit. Or, choose a completely integrated system, skid-mounted and ready to install.

Xebec's Membrane Nitrogen Generator — N2XM



Xebec's hollow fiber, polymer membranes are highly selective

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Best in Class Air/N_2 Ratio

N_2 Output Design Capacity Table
Membrane Nitrogen Generators

N_2 Output Design Capacity (at design basis conditions)										
Model	SCFM	NCMH	SCFM	NCMH	SCFM	NCMH	SCFM	NCMH	SCFM	NCMH
	95%		96%		97%		98%		99%	
N2XM-5	5	8	4	6	3	5	2	4	2	3
N2XM-10	10	15	8	13	6	10	5	8	3	5
N2XM-14	14	23	12	19	10	15	7	12	5	7
N2XM-19	19	31	16	25	13	20	10	15	6	10
N2XM-29	29	46	24	39	20	31	15	24	10	16
N2XM-40	40	65	34	54	27	44	21	34	14	23
N2XM-58	58	92	48	77	39	63	30	48	20	32
N2XM-86	86	138	72	116	58	94	44	71	30	48
N2XM-115	115	185	96	154	78	125	59	95	40	64
N2XM-144	144	231	120	193	97	156	74	119	50	80
N2XM-173	173	277	144	231	117	188	89	143	60	97
Air/N_2 Ratio	2.5		2.7		3.1		3.6		4.7	

Capacity calculations are at design basis conditions.
Specifications listed above are typical values. Each membrane unit will be sized on a case by case basis according to customer process requirements.

Design Basis
Membrane Nitrogen Generators

Design Basis	
Standard Conditions - Temperature and Pressure	60°F/16°C - 1 atm
Normal Conditions - Temperature and Pressure	32°F/10°C - 1 atm
Inlet Compressed Air Temperature	131°F/55°C
Pressure	174 psig/12 barg
Nitrogen Outlet Pressure	Up to 160 psig/11 barg
Minimum Compressed Air Inlet Quality	ISO8573-1 Class 1-4-1

Flexible Pressure and Temperature Range

Correction Factors
Membrane Nitrogen Generators

Multiply Nitrogen Flow — Air/N_2 Ratio by correction Factor — $K_{N_2}T/K_{Air/N_2}T$											
Temperature		$K_{N_2}T$					$K_{Air/N_2}T$				
°F	°C	95%	96%	97%	98%	99%	95%	96%	97%	98%	99%
77	25	0.87	0.88	0.89	0.92	0.94	0.8	0.74	0.77	0.75	0.72
95	35	0.92	0.92	0.93	0.94	0.97	0.88	0.89	0.87	0.86	0.89
113	45	0.95	1.0	0.97	0.97	0.98	0.92	0.93	0.94	0.92	0.94
122	50	0.98	0.98	0.99	0.99	0.99	0.96	0.96	0.97	0.97	0.98
131	55	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Multiply Nitrogen Flow — Air/N_2 Ratio by correction Factor — $K_{N_2}P/K_{Air/N_2}P$											
Pressure		$K_{N_2}P$					$K_{Air/N_2}P$				
psig	barg	95%	96%	97%	98%	99%	95%	96%	97%	98%	99%
102	7	0.51	0.51	0.51	0.51	0.52	1.04	1.04	1.03	1.06	1.09
131	9	0.7	0.7	0.7	0.71	0.71	1.04	1.0	1.0	1.03	1.04
174	12	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Sizing Examples
PSA Nitrogen Generators

Sizing Example

NTXM-14 system @ 99%, 6 barg, 35°C:

Nitrogen flow at design basis conditions **= 7 NCMH**

For 35°C and 9 barg:
$K_{N_2}T = 0.97$ | $K_{N_2}P = 0.71$

Nitrogen Flow =
7 NCMH x 0.97 x 0.71 **= 5 NCMH**

Air/N2 Ratio at design basis conditions = 4.7

For 35°C and 9 barg:
$K_{Air/N_2}T = 0.89$ | $K_{Air/N_2}P = 1.04$

Inlet Air Flow =
5 NCMH x 4.7 x 0.89 x 1.04
= 21 NCMH

Technical Specifications
Membrane Nitrogen Generators

Model	Connections			Dimensions						Weight	
	Air Inlet	Nitrogen Outlet	Exhaust Outlet	Height		Width		Depth			
				mm	in	mm	in	mm	in	kg	lbs
N2XM-5	½"	⅜"	¾"	2007	79	610	24	610	24	265	583
N2XM-10	¾"	½"	1"	2007	79	610	24	610	24	270	594
N2XM-14	¾"	½"	1.5"	2007	79	610	24	610	24	275	605
N2XM-19	1"	¾"	1.5"	2007	79	610	24	610	24	295	649
N2XM-29	1"	¾"	1.5"	2007	79	610	24	610	24	320	704
N2XM-40	1.5"	1"	2"	2007	79	787	31	787	31	460	1012
N2XM-58	1.5"	1"	2"	2007	79	787	31	787	31	475	1045
N2XM-86	1.5"	1.5"	2.5"	2007	79	787	31	787	31	495	1089
N2XM-115	2"	1.5"	2.5"	2007	79	787	31	787	31	545	1199
N2XM-144	2"	1.5"	3"	2007	79	787	31	787	31	585	1287
N2XM-173	2"	1.5"	3"	2007	79	787	31	787	31	610	1342

Xebec reserves the right to change the design and/or dimensions and/or weight at any time without any notice or liability.

XEBEC ADSORPTION INC. | 730 Boul. Industriel, Blainville, Quebec | CANADA J7C 3V4
Canada Toll Free: 1-877-469-3232 | **Canada Fax:** (450) 979-7869 | **USA Toll Free:** 1-866-622-9100 | **USA Fax:** (832) 532-8746
Email: sales@xebecinc.com | **www.xebecinc.com**

All in One Nitrogen Generation Skid

COMPACT. Plug and play.

Xebec's PSA and Membrane Nitrogen Generators are supplied as individual components to your existing system or they can be packaged in a compact, skid-mounted system with a compressor, air and nitrogen receivers, filters and fully automated programmable logic controller (PLC). Other options can be easily added.

EASY TO OPERATE. Simple start-up. Constant monitoring.

You can operate and monitor the complete system with a simple-to-use operator interface (HMI). The system's operational sequences are controlled by the PLC, so there is minimal manual intervention. The operator simply selects the desired mode, such as starting the system, from the operator interface and it will automatically reach "Normal Operating Mode" within a few minutes. As an option, the control system can also include an advanced performance and data analyzing tool accessible remotely via Xebec's cloud server through a computer or smart device, such as a tablet or smart phone.

RELIABLE. Optimal performance.

Components are pre-commissioned and system-tested prior to delivery so you are up and running in no time. Xebec has built and delivered more than 9000 adsorption units globally and continues to service many of them, after decades of operation.

Large, PLC touchscreen is easy to use, easy to read

- Start/stop the system
- Measure product flow rate
- Monitor pressure & temperature
- Option for remote monitoring
- With other options you can also display product flow rate and purity

Xebec's Skid-Mounted Nitrogen Generator Systems

Options and Customization

Options, Accessories, and Aftermarket Parts

Xebec's nitrogen generation systems are fully customizable or our standard solutions can be equipped with a variety of options; easily integrated, compatible, best cost equipment and supplies.

- Air Compressors
- Refrigerant Dryers
- Air & Nitrogen Receivers
- Nitrogen Booster & Cylinder Filling Station
- Desiccant Dryers
- High Pressure Gas Storage
- Advanced Control System
- Touchscreen PLC
- Activated Carbon Towers
- Replacement Filters
- Replacement Adsorbent
- Oxygen Analyzers
- Nitrogen Flow Meters
- Pressure Regulators
- Air Heaters for Membrane Nitrogen Generators

Air & Nitrogen Receivers Dryers

Activated Carbon Towers

Air & Nitrogen Filters

Refrigerant Dryers

Desiccant Dryers

Replacement Adsorbent

Selection

Compare What's Right For Your Operation

Xebec offers a competitive package on performance, CAPEX and OPEX.

In countries where power consumption is a point of concern, PSAs are a lower cost option because of the energy consumption of the compressor which operates around 110 psig/7.5 barg. Membrane systems work at higher pressure, around 175 psig/12 barg; and so consume more energy than a PSA.

System selection also depends on required purity, temperature, pressure, and flow. Thus, the two systems need to be compared in regards to performance and cost before making an appropriate technology decision.

Xebec will help you make the right decision, at the lowest cost of ownership.

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Email: sales@xebecinc.com | **www.xebecinc.com**

Choose Xebec. We do the rest.

Whether you choose a complete system for nitrogen generation, an individual component PSA or membrane unit, or you want to upgrade to a unit with an engineering package to get you up and running, Xebec offers numerous advantages with the best cost/value in the business.

Easy to Work With

- ✓ Single point of contact — always available for you
- ✓ Simple selection process — standard solutions that will easily meet your needs
- ✓ Fully supported engineering team — quick and efficient answers to all your questions
- ✓ Quick turnaround from quote to installation

Quality and Cost Conscious

- ✓ Quality design — Xebec is committed to cost/value, constantly innovating for cost containment, offering you only what you need for the lowest cost of ownership

Concern for the Environment

- ✓ Xebec equipment is designed for low environmental emissions/consumable consumption — no additional ancillary materials such as water or sorbents (amines, glycols) are required

Experienced

- ✓ In business for 50 years — Xebec has built more than 9000 adsorption systems globally; 250 units for biogas, helium, and hydrogen purification; and 25 biogas upgrading plants including landfill gas, food digester gas, organic farm waste gas, palm oil mill effluent (POME), mixed waste gas, and wastewater treatment plant gas

End to End Support… and Beyond

- ✓ Project documentation — everything you need to give you confidence and support — from datasheets and drawings to procedures, test reports, certifications, etc.
- ✓ Aftermarket parts and service — from commissioning and installation to MRO and 7/24 emergency services, spare parts, filters, desiccant

A world powered by clean energy

About Xebec

Xebec specializes in clean air and gas. With over 50 years of experience in adsorption technology, Xebec has supplied more than 9000 adsorption systems to more than 1500 customers worldwide.

This solid foundation of expertise and experience has led Xebec's evolution into renewable energy — developing products, systems and technology solutions for environmentally-responsible purification, generation, dehydration, separation and filtration equipment.

Today, Xebec designs, engineers and manufactures innovative products that transform raw gases into marketable sources of clean energy for the natural gas, field gas, biogas, helium, hydrogen, nitrogen, oxygen, and compressed air markets.

Customer Commitment. Quality Focus.

Committed to first class customer service, Xebec stands behind the service, spare parts and technical support needed to keep your equipment up and running at maximum performance.

Xebec and You... End to End

Whatever your needs — for compressed air or gas dehydration and filtration, purification, gas generation, Xebec can offer a solution.

Professional Services

- 3D and Adsorption Modelling
- Basic and Detailed Engineering
- Custom Adsorption Design and Fabrication
- Electrical Design and Engineering
- Full Turnkey Solutions
- Mechanical and Piping Design
- Process Control and Automation
- Process Engineering
- Process/Product Development Services (Contract R&D)
- Process Simulation and Modelling
- Project Management

Aftermarket Services AMX SOLUTIONS

- 7/24 Troubleshooting Support
- Custom Service/Maintenance Contracts
- Desiccants
- Parts — Filters, Separators, Elements, Drains, Hygrometers, Probes, Probe Recalibration
- Training — Workshops, Webinars, Certification

CANADA

XEBEC Adsorption, Inc.
730 Boul. Industriel
Blainville, Quebec
J7C 3V4

Phone: (450) 979-8700
Toll Free: 1 (877) 469-3232
Fax: (450) 979-7869
Email: sales@xebecinc.com

UNITED STATES

XEBEC Adsorption USA, Inc.
11211 Katy Freeway,
Suite 320
Houston, TX 77079

Phone: (832) 532-8741
Fax: (832) 532-8746
Email: sales@xebecinc.com

CHINA

XEBEC Adsorption (Shanghai), Co. Ltd.
No. 92, Block 5,
East Jiangtian Road
Songjiang Economic Zone,
Shanghai

Phone: +86 21 3352 8700
Fax: +86 21 3352 8705
Email: chinasales@xebecinc.com

www.xebecinc.com