



A·C·I
Pharma

Equipos especiales



- ▶ Generadores de Gas Nitrógeno

- ▶ Generadores de Aire Respirable para la industria



Generadores de nitrógeno
NANO

Breathing air system
NANO

nano



ultra-high purity
nitrogen generators

nitrogen purity: 95% to 99.999%

N₂ *plus*



Soluciones Empresariales en Aire y Agua

Atopina No. 8, Col. San Pedro Apóstol,
C.P. 14070, Tlalpan, México D.F.

Oficinas (55) 5235-3478, 2455-9301
Celular 4424 650 879
solucioneseaa@hotmail.com

nitrogen purity: 95% to 99.999%

Leading edge technology and more than 100 years of **experience**...nano-purification solutions, your world-class provider of state-of-the-art compressed air and gas solutions to industry.

Our commitment at n-psi is to work alongside our **customers** and provide unique solutions with the highest quality products to solve your specific challenges.

A wealth of experience and leading edge products are only part of the equation. n-psi realize that world-class customer **service** is the most important component to any successful business.

Experience. Customer. Service...**n-psi**



dry and pure

Nitrogen is used in many commercial and industrial applications to improve the quality of a product or process, or as a safety measure to prevent combustion. Liquid or bottled nitrogen delivery and storage can be expensive, unreliable and a safety concern. Nitrogen generators allow users to produce nitrogen in-house simply and inexpensively using an existing compressed air system.

n-psi recognizes the importance of having a safe, reliable and cost effective supply of high-purity nitrogen. We have developed the N_2^{plus} nitrogen generator to meet the increasing demand for high quality complete packaged solutions which save energy and time while fulfilling the needs of their intended application.



design

Our experienced team of design engineers are always looking for new and unique technologies and products to bring you the highest level of performance and lowest overall operating cost.



research & development

Our R&D team endeavor to provide solutions that go beyond developing an existing product. They are continually researching new technologies which can provide unique advantages over competitive offerings.



manufacture

The reliable and energy saving nano N_2^{plus} nitrogen generators are manufactured in a state of the art facility to the highest standards of build quality to ensure reliability and high levels of performance.

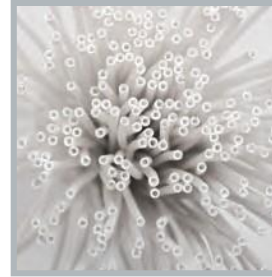
nano N₂^{plus} nitrogen generators

Nitrogen is a dry, inert gas which is used in a wide range of applications where oxygen may be harmful to the product or processes. Nitrogen generators use regular compressed air to deliver a continuous supply of high purity nitrogen - offering a cost effective and reliable alternative to the use of cylinder or liquid nitrogen across a wide range of applications.

The advanced nano N₂^{plus} range of nitrogen generators use integrated Adsorbent Media Tube (AMT) dryer cartridges to provide dehydration of the compressed air prior to separation. This innovative feature (patent pending) eliminates the need for a separate desiccant dryer saving up to 20% purge loss, significantly reducing capital and installation costs and reducing overall pressure drop by 10 psig or more over traditional nitrogen generation systems.

A few of the many industries making the switch to nano N₂^{plus} nitrogen generators include:

- food (MAP)
- beverage (bottling)
- plastics (PET)
- pharmaceutical (product transfer)
- chemicals (blanketing)
- laser metal cutting (burring reduction)
- fire prevention (eliminating combustion)
- electronics (wave soldering)



Adsorbent Media Tubes (AMT)



reliability is built in... and backed by a 2 year warranty



scan this tag for a technical paper explaining the many advanced features of the nano N₂^{plus} range of nitrogen generators and its Adsorbent Media Tube (AMT) cartridges

benefits - get more for your money

guaranteed performance

- reliable performance based on decades of experience with pressure swing adsorption technology
- 100% function and performance tested at the factory
- 2 year warranty

rapid return on investment

- significant cost savings over cylinder or liquid supply provides a typical return on investment of less than 24 months

environmentally friendly

- lower air consumption and refined controls provide greater energy efficiency
- reduces carbon footprint by eliminating gas delivery to your facility

safe & reliable

- eliminates the safety hazards of transporting and storing pressurized gas cylinders or liquid nitrogen

easy to install

- the compact design allows installation in spaces too small for twin tower generator systems

easy to maintain

- integrated Adsorbent Media Tube (AMT) dryer cartridges eliminate the need for an external dryer of any type
- integrated exhaust silencers require no maintenance or replacement and ensure proper performance
- advanced controls simplify operation and require minimal training
- innovative valves significantly reduce maintenance schedules and minimize downtime

fits any application

- available in a wide range of flow rates and purities (oxygen contents from 5% to less than 10 ppm)
- can handle any power supply from 120 to 240 VAC in 50 or 60 Hz, or 24VDC - with just the flick of a switch

nano N₂ plus nitrogen generators

integrated AMT dryer cartridge

Traditional nitrogen generators often require installing and operating an external desiccant dryer. The innovative nano N₂ plus nitrogen generators feature an integrated Adsorbent Media Tube (AMT) dryer cartridge which eliminates the need for a pre-treatment dryer of any type. The integrated drying system reduces purge loss by approximately 20% and reduces pressure drop by 10 psi or more, providing significant energy savings over a traditional generator system.

ecomode energy saving control

This unique control feature utilizes an outlet pressure monitor to reduce energy consumption during periods of low demand to ensure a continuous uninterrupted nitrogen supply while minimizing power consumption.

PLC controlled operation

Each N₂ plus nitrogen generator is operated by a reliable PLC control system with digital and analog outputs for remote monitoring and alarm capabilities. Includes an easy-to-operate touch screen graphical interface which offers valuable features including 'power on', 'hours run', 'oxygen purity', 'pressure', 'online column' and 'service required' indicators. In addition, four pressure gauges provide the operator with continuous indication of column A, column B, air inlet and nitrogen outlet pressures.

multi-bank design

The unique multi-bank design (NNG 2110 to NNG 12130) enables additional generators to be added in the future as demand increases. Your N₂ plus nitrogen generator can grow with your company.

reliable high performance valves

Inlet, outlet and exhaust are managed through coaxial flow valves integrated into the upper and lower manifolds. These low maintenance valves provide unrestricted flow capacity. They are designed for durability, ease of maintenance and long service life and are backed by a comprehensive two year warranty.

maximum corrosion protection

High tensile aluminum columns are first alocromed and then powder coated to provide maximum protection for corrosive environments.

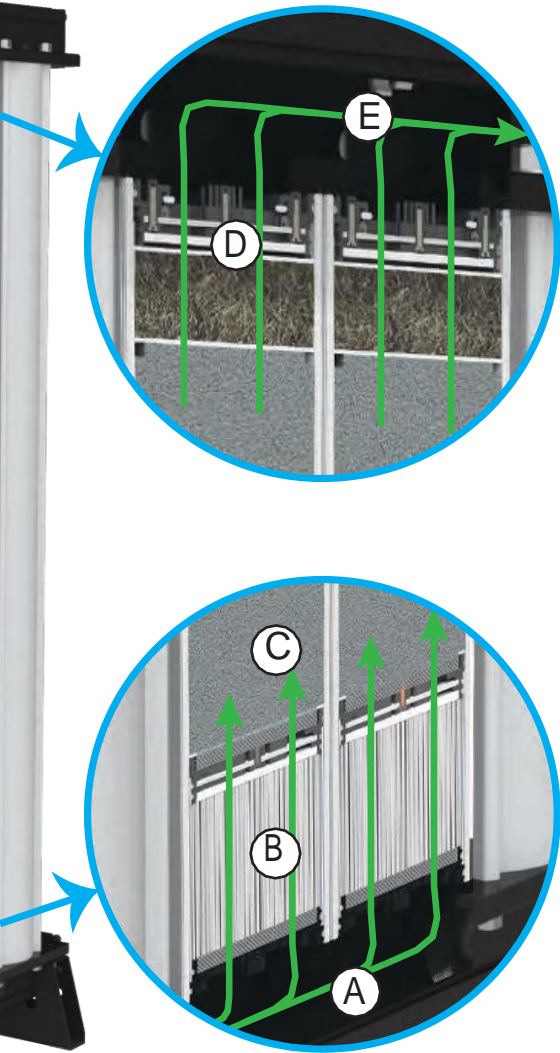
oxygen analyzer

A built in oxygen analyzer continuously monitors the oxygen concentration in the nitrogen stream. The analyzer is incorporated into the PLC controls to guarantee downstream purity levels are consistently achieved and maintained.



A	inlet manifold
B	Adsorbent Media Tube (AMT) dryer cartridges
C	Carbon Molecular Sieve (CMS)
D	integrated bed support layer
E	outlet manifold

system performance



The technologically advanced nano N_2 *plus* nitrogen generator operates on the Pressure Swing Adsorption (PSA) principle to produce a continuous uninterrupted stream of nitrogen gas from clean dry compressed air.

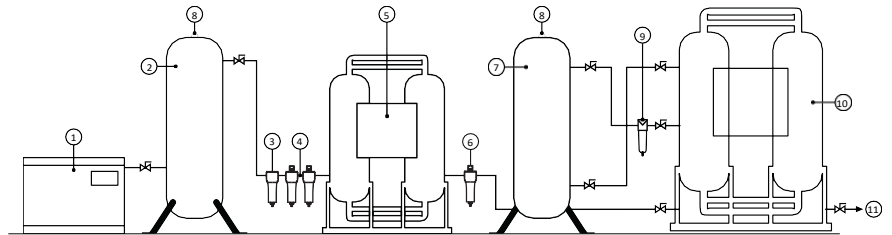
Pairs of dual chamber extruded aluminum columns are fitted with Adsorbent Media Tube (AMT) dryer cartridges and filled with Carbon Molecular Sieve (CMS). Joined via an upper and lower manifold, the high density filled columns produce a two bed system.

Compressed air enters through the inlet manifold (A) to the bottom of the 'online' bed and flows up through the AMT stage (B) drying the compressed air. The clean and dry air then flows up through the CMS stage (C) where oxygen and other trace gases are preferentially adsorbed allowing the nitrogen to pass through. The nitrogen then passes through the supporting bed layer (D) and outlet manifold (E) to the buffer vessel and a nano F¹ buffer vessel filter before re-entering the nano N_2 *plus* nitrogen generator for purity monitoring.

After a pre-set time the control system automatically switches the beds. One bed is always online generating nitrogen while the other is being regenerated.

During regeneration, the oxygen that has been collected in the CMS stage and the moisture that has been collected in the AMT stage are exhausted to atmosphere. A small portion of the outlet nitrogen gas is expanded into the bed to accelerate the regeneration process.

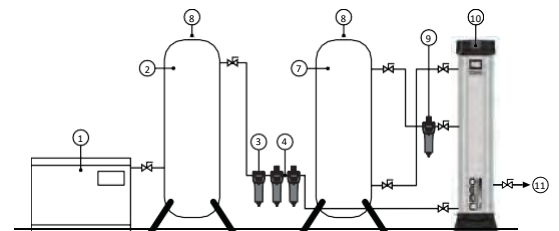
typical nitrogen generator installation



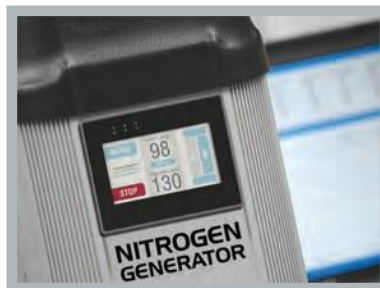
1	compressor
2	wet air receiver
3	water separator
4	pre filters
5	dryer *
6	dust filter *
7	buffer vessel
8	pressure relief valves
9	buffer vessel filter
10	nitrogen generator
11	nitrogen outlet

* not required with nano N_2 *plus*

nano N_2 *plus* installation



Adsorbent Media Tubes (AMT)



PLC controls with touch screen interface



reliable & durable coaxial flow valves

sizing & specifications

generator model	rated outlet flow (1)	nitrogen purity at the outlet (maximum oxygen content)												dimensions (inches)			approx. weight
		99.999% (10 ppm)	99.995% (50 ppm)	99.99% (100 ppm)	99.75% (250 ppm)	99.95% (500 ppm)	99.9% (0.10%)	99.5% (0.50%)	99% (1%)	98% (2%)	97% (3%)	96% (4%)	95% (5%)	A	B	C	lbs
NNG 1110	scfh	21	35	56	67	74	88	134	159	194	230	265	282	49	16	12	176
	m ³ /hr	0.6	1.0	1.6	1.9	2.1	2.5	3.8	4.5	5.5	6.5	7.5	8.0				
NNG 2110	scfh	42	71	113	134	148	177	268	318	388	459	530	565	47	16	26	242
	m ³ /hr	1.2	2.0	3.2	3.8	4.2	5.0	7.6	9.0	11.0	13.0	15.0	16.0				
NNG 3110	scfh	64	106	169	201	222	265	403	477	583	689	794	847	47	16	32	374
	m ³ /hr	1.8	3.0	4.8	5.7	6.3	7.5	11.4	13.5	16.5	19.5	22.5	24.0				
NNG 2130	scfh	71	134	191	254	304	318	501	636	777	918	1024	1130	71	16	26	365
	m ³ /hr	2.0	3.8	5.4	7.2	8.6	9.0	14.2	18.0	22.0	26.0	29.0	32.0				
NNG 3130	scfh	106	201	286	381	455	477	752	953	1165	1377	1536	1695	71	16	32	490
	m ³ /hr	3.0	5.7	8.1	10.8	12.9	13.5	21.3	27.0	33.0	39.0	43.5	48.0				
NNG 4130	scfh	141	268	381	508	607	636	1003	1271	1554	1836	2048	2260	71	16	39	610
	m ³ /hr	4.0	7.6	10.8	14.4	17.2	18.0	28.4	36.0	44.0	52.0	58.0	64.0				
NNG 6130	scfh	212	403	572	763	911	953	1504	1907	2330	2754	3072	3390	71	16	52	852
	m ³ /hr	6.0	11.4	16.2	21.6	25.8	27.0	42.6	54.0	66.0	78.0	87.0	96.0				
NNG 8130	scfh	268	510	725	966	1154	1208	1905	2415	2952	3489	3891	4294	71	16	65	1100
	m ³ /hr	7.6	14.4	20.5	27.4	32.7	34.2	54.0	68.4	83.6	98.8	110	122				
NNG 10130	scfh	328	624	887	1182	1412	1478	2332	2955	3612	4269	4762	5254	71	16	79	1350
	m ³ /hr	9.3	17.7	25.1	33.5	40.0	41.9	66.0	83.7	102	120.9	135	149				
NNG 12130	scfh	381	725	1030	1373	1640	1716	2708	3432	4195	4958	5530	6102	71	16	92	1600
	m ³ /hr	10.8	20.5	29.2	38.9	46.4	48.6	76.7	97.2	119	141	157	173				

specifications

design operating pressure range	87 - 145 psig ⁽²⁾
design operating temperature range	50 - 104°F
maximum inlet particulate	0.1 micron
maximum inlet dew point	80°F PDP
maximum inlet oil content	0.01 ppm ⁽³⁾
maximum outlet dew point	-40°F PDP ⁽⁴⁾
supply voltage	120 - 240 VAC (50 or 60Hz) or 24VDC

pressure correction factors ⁽⁵⁾

operating pressure (psig)	90	100	115	130	145
correction factor	0.90	1.00	1.10	1.20	1.25

temperature correction factors ⁽⁵⁾

inlet temperature (°F)	50 - 75	85	95	105
correction factor at 10 ppm O ₂	1.00	0.90	0.81	0.66
correction factor at 50 - 500 ppm O ₂	1.00	0.98	0.86	0.75
correction factor at 0.1 to 5.0% O ₂	1.00	0.98	0.95	0.90

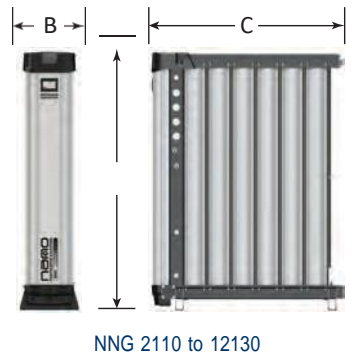
(1) at 100 psig inlet pressure and 68 - 77°F inlet temperature. For outlet flow at all other conditions refer to the correction factors above or contact support@n-psi.com

(2) for pressures above 145 psig contact support@n-psi.com

(3) including oil vapor

(4) outlet gas dew point is < -76°F (-60°C) in high purity applications

(5) to be used as a rough guide only. All applications should be confirmed by n-psi. Contact us for sizing assistance



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Oficinas (55) 5235-3478, 2455-9301
Celular 4424 650 879
solucioneseaa@hotmail.com



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exceeds global
breathing air
quality standards

nano



B¹ breathing air systems

flow capacity: 6 - 486 scfm



breathing air systems

flow capacity: 6 - 486 scfm

B¹

Leading edge technology and hundreds of years of **experience**...nano-purification solutions, your world-class manufacturer of state-of-the-art compressed air and gas solutions to industry.

Our commitment at nano is to work alongside our **customers** and provide unique solutions with the highest quality products to solve your specific challenges.

A wealth of experience and leading edge products are only part of the equation. nano recognize that world-class customer **service** is the most important component to any successful business.

Experience. Customer. Service... **nano**



clean and safe

Many commercial and industrial processes can introduce contaminants into the air which threaten the health and safety of employees. It is important to choose a breathing air system that is safe, reliable, and high quality - yet cost effective to own and operate.

nano recognize the importance of meeting international breathing air quality standards and protecting employees from hazardous environments. We have developed the B¹ breathing air systems to meet and exceed global standards for breathing air quality in a comprehensive package with reliable performance.



design

Our experienced team of design engineers are always looking for new and unique technologies and products to bring you the highest level of performance and lowest overall operating cost.



research & development

Our R&D team endeavor to provide solutions that go beyond developing an existing product. They are continually researching new technologies which can provide unique advantages over competitive offerings.



manufacture

Always reliable, nano B¹ breathing air systems are manufactured in our state of the art facility to the highest standards of build quality to ensure reliability and high levels of performance.

nano B¹ breathing air systems

In industry, there is perhaps no more critical use of compressed air than for breathing. Whether blasting with fine abrasives, cleaning tanks in hazardous locations or applying finishes to consumer products, high quality breathable compressed air is an absolute necessity to ensure the safety of the user.

If the compressed air is of sufficiently high quality and free of harmful gases, a filtration system to remove particulate, oil, odor and taste may be used in conjunction with a Carbon Monoxide (CO) monitor. These systems are available at a lower initial investment and meet many breathing air standards. If however, gases such as CO₂ or CO may be present in dangerous levels, both filtration and purification are required.

nano-purification solutions is a leading manufacturer of breathing air products and has the experience to recommend, provide and support your breathing air system, whether you need a portable case, wall mounted panel or a complete modular purification system.

The nano B¹ breathing air systems use the latest technology to provide clean, reliable and safe breathing air that meets or exceeds global standards. Contact us today and let our technical support department help you choose the breathing air system that best fits your needs.



reliability is built in... and backed by a 2 year warranty

global breathing air quality standards

When applied, operated and maintained correctly, the nano range of B¹ breathing air cases, panels and purifier systems are guaranteed to meet and exceed global standards for breathing air quality.



	United States	Canada	UK & Europe
standard	CGA7.1 OSHA Grade D	CSA Z180.1-13	EN12021
maximum dew point	varies by application	5°C below lowest system temperature	-23°F (-31°C)
maximum oil content	5 mg/m ³	1mg/m ³	0.01 mg/m ³
odor & taste	no pronounced odor	no pronounced odor	no pronounced odor
allowable O ₂ range	19.5 to 23.5%	20 to 22%	21% ± 1%
maximum CO level	10 ppm	< 5 ppm	< 5 ppm
maximum CO ₂ level	1000 ppm	< 600 ppm	< 500 ppm

if there is a known presence of harmful gases, please consult n-psi prior to selecting a breathing air product

portable breathing air cases

The nano BAC portable breathing air case is the solution for one or multiple users who need a robust, go anywhere breathable air filtration system.

With maximum flow rates of either 50 scfm or 100 scfm, the impact and water resistant case houses a nano F¹ NWS water separator, an M01 0.01 micron coalescing filter with automatic condensate drains and an AC activated carbon adsorber to remove moisture, oil aerosols, odors and taste to 0.003 ppm all in one simple, portable package.

All BAC cases include an adjustable pressure regulator and Carbon Monoxide (CO) monitor* to ensure safe and reliable operation.

- portable, impact and water resistant case
- 50 or 100 scfm maximum flow rates
- four outlet connections for multiple users
- adjustable pressure regulator
- integral CO monitor*
- complies with OSHA Grade D (US) and CSA Z180.1-13 (Canada) breathing air standards



wall mounted breathing air panels

The nano BAP breathing air panel is the optimum solution for one or more users who require a convenient, high quality breathable air filtration system but don't require the portability of a case. This easy to install panel can be mounted to a wall, skid or any location that requires breathing air on a regular basis, such as a blasting or paint booth, a confined space, a hazardous area or a tank cleaning location.

As with the portable case, the BAP panels include a nano F¹ NWS water separator, an M01 0.01 micron coalescing filter with automatic condensate drains and an AC activated carbon adsorber to remove moisture, oil aerosols, odors and taste to 0.003 ppm.

- wall or skid mountable
- 50, 100 or 175 scfm flow rates available
- multiple outlet connections for multiple users
- adjustable pressure regulator
- integral CO monitor*
- complies with OSHA Grade D (US) and CSA Z180.1-13 (Canada) breathing air standards



* does not remove CO, only monitors it

modular breathing air purifier systems



While many breathing air applications may require only the removal of particulate, oil, odor and taste, others may also require the removal of hazardous gases.

Carbon Dioxide (CO₂) and Carbon Monoxide (CO) are odorless, tasteless gases that can be harmful or even lethal if inhaled - especially in high concentrations. If there is the potential for high levels of CO or CO₂ in the air, it is imperative they are reduced to safe levels for breathing.

These critical applications call for the nano modular NBA breathing air purifier. The NBA purifiers start by filtering the air using an M1 1.0 micron pre-filter and an M01 0.01 micron high-efficiency coalescing pre-filter. However, the NBA then also removes CO and CO₂ using a 4-layer, mixed bed cartridge in aluminum extruded vessels.

The nano B¹ breathing air purifier systems are based on the tested and proven nano D¹²¹³ modular dryers but employ a unique split cartridge system to completely treat the air prior to respiration.

The first stage of the cartridge removes water vapor to -40°F/C pressure dew point and polishes CO₂ using a novel activated alumina and 13X molecular sieve mix. The second stage utilizes activated carbon to remove hydrocarbons, odor and taste. Finally, the last stage of the cartridge employs a catalyst to convert CO to CO₂. All materials are snow storm filled for maximum packing density and are held in place by an integral 1 micron particulate after filter. These innovative cartridges are quick and easy to replace minimizing maintenance requirements.

The nano NBA is on the leading edge of breathing air technology, meeting and exceeding the most stringent global breathing air standards in a simple, reliable and cost effective design.

accessories & options

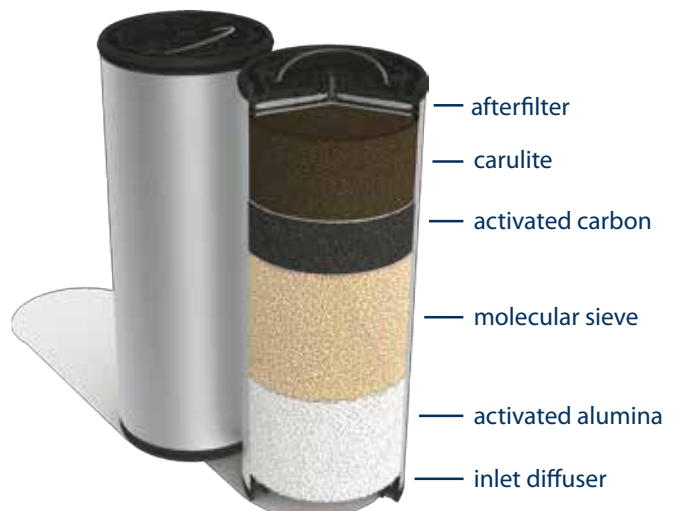
nano-purification solutions has a wide range of options and upgrades to customize your B¹ breathing air system including remote audible and visual alarms, free-standing CO monitors and all of the test kits, calibration kits and service kits you need to keep your B¹ products working at their optimum level of performance.



remote audible & strobe alarms



stand alone CO & O₂ monitors



4-layer mixed bed cartridge

sizing & specifications

model	inlet connection			outlet connection(s)			flow (scfm) ⁽⁴⁾		dimensions (inches)			approx. weight
	size	type	qty	size	type	qty	inlet	outlet	height	width	depth	lbs
breathing air panels												
BAP 050 CP N	½"	NPT(F)	1	¾"	NPT(F)	4	50	50	23	22	8.0	28
BAP 050 CP H	½"	NPT(F)	1	¼"	Hansen ⁽¹⁾	4	50	50	23	22	8.0	28
BAP 050 CP S	½"	NPT(F)	1	¼"	Schrader ⁽¹⁾	4	50	50	23	22	8.0	28
BAP 100 CP N	¾"	NPT(F)	1	¾"	NPT(F)	4	100	100	23	22	8.0	40
BAP 100 CP H	¾"	NPT(F)	1	¼"	Hansen ⁽¹⁾	4	100	100	23	22	8.0	40
BAP 100 CP S	¾"	NPT(F)	1	¼"	Schrader ⁽¹⁾	4	100	100	23	22	8.0	40
BAP 175 CP N	¾"	NPT(F)	1	¾"	NPT(F)	6	175	175	23	22	8.0	45
BAP 175 CP H	¾"	NPT(F)	1	¼"	Hansen ⁽¹⁾	6	175	175	23	22	8.0	45
BAP 175 CP S	¾"	NPT(F)	1	¼"	Schrader ⁽¹⁾	6	175	175	23	22	8.0	45
portable breathing air cases												
BAC 050 CP N	½"	NPT(F)	1	¾"	NPT(F)	4	50	50	17	24	8.5	28
BAC 050 CP H	½"	NPT(F)	1	¼"	Hansen ⁽¹⁾	4	50	50	17	24	8.5	28
BAC 050 CP S	½"	NPT(F)	1	¼"	Schrader ⁽¹⁾	4	50	50	17	24	8.5	28
BAC 100 CP N	½"	NPT(F)	1	¾"	NPT(F)	4	100	100	21	27	9.0	40
BAC 100 CP H	½"	NPT(F)	1	¼"	Hansen ⁽¹⁾	4	100	100	21	27	9.0	40
BAC 100 CP S	½"	NPT(F)	1	¼"	Schrader ⁽¹⁾	4	100	100	21	27	9.0	40
modular breathing air purifier systems												
NBA 030	½"	PTC ⁽²⁾	1	½"	PTC ⁽²⁾	1	8	6	25	10	13	29
NBA 050	½"	PTC ⁽²⁾	1	½"	PTC ⁽²⁾	1	19	14	43	10	13	44
NBA 070	1"	NPT(F)	1	1"	NPT(F)	1	34	26	30	17	13	88
NBA 090	1"	NPT(F)	1	1"	NPT(F)	1	54	41	36	17	13	119
NBA 110	1"	NPT(F)	1	1"	NPT(F)	1	86	65	49	17	13	172
NBA 120	1"	NPT(F)	1	1"	NPT(F)	1	108	81	59	17	13	209
NBA 2110	2"	NPT(F)	1	2"	NPT(F)	1	172	129	48	12	27	366
NBA 2120	2"	NPT(F)	1	2"	NPT(F)	1	216	162	58	12	27	441
NBA 3120	2"	NPT(F)	1	2"	NPT(F)	1	324	243	58	12	31	600
NBA 4120	2 ½"	NPT(F)	1	2 ½"	NPT(F)	1	432	324	58	12	37	800
NBA 6120	2 ½"	NPT(F)	1	2 ½"	NPT(F)	1	648	486	58	12	51	1155
specifications												
	BAP Panels			BAC Cases			NBA 030 to 050		NBA 070 to 120		NBA 2110 to 6120	
operating pressure range (for United States)	15 to 150 psig			15 to 150 psig			87 to 232 psig		87 to 232 psig		87 to 145 psig ⁽³⁾	
operating pressure range (for Canada)	15 to 150 psig			15 to 150 psig			87 to 101 psig		87 to 217 psig		87 to 145 psig ⁽³⁾	
recommended operating temp range	35 to 86°F			35 to 86°F			50 to 86°F		50 to 86°F		50 to 86°F	

(1) female style coupling (2) PTC = push to connect fittings (3) contact support@n-psi.com for higher pressures or flows (4) flow rates based on 100 psig and 86°F inlet temperature
 • contact support@n-psi.com for intrinsically safe, integrated CO & O₂ monitoring or any options or equipment not listed
 • quick-disconnect fittings for use in compressed breathing air systems shall be selected to prevent accidental connection to other sources of compressed gases



BAP 050 - 175 CP



BAC 050 - 100 CP



NBA 030 - 120



NBA 2110 - 6120

nano-purification solutions
 5509 david cox road
 charlotte, nc 28269 usa
 tel: 704.897.2182
 fax: 704.897.2183
 email: support@n-psi.com
 web: www.n-psi.com

nano-purification solutions
 188 bunting road, unit 8b
 st. catharines, ontario l2m3p8 canada
 tel: 704.897.2182
 fax: 704.897.2183
 email: support@n-psi.com
 web: www.n-psi.com



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