Balston Nitrogen Gas Generation

Hollow Fiber Membrane & Pressure Swing Adsorption Solutions

HFX, MB and DB Series

ENGINEERING YOUR SUCCESS.

Why Nitrogen?

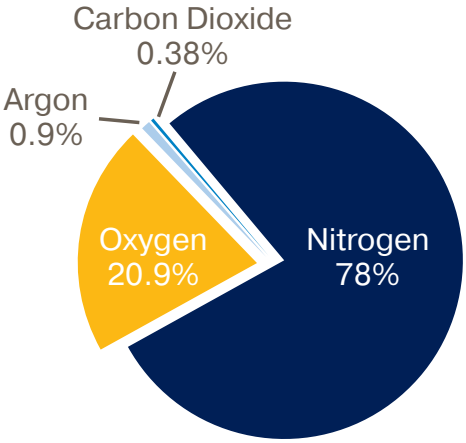
Nitrogen (N2) is a colorless, odorless and tasteless gas, which makes up 78% of earth's atmosphere. Its inert properties and natural abundance have made it a highly popular choice throughout industry.

Because it is a clean, dry, inert gas, nitrogen is ideal for displacing oxygen, which can have very undesirable effects on certain products or production processes.

By removing oxygen, we can prevent oxidation of materials, stop bacterial growth, and reduce the risk of combustion and explosion.

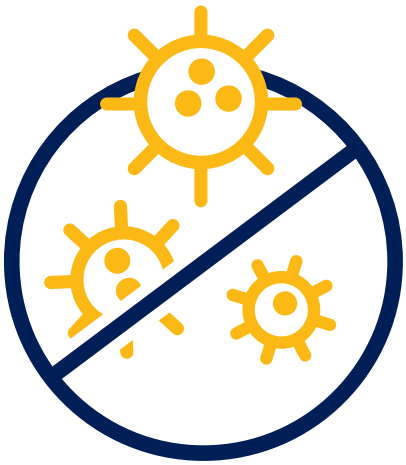
Nitrogen is used for a wide range of industrial applications, including:

- Food and beverage
- Lasers
- Chemicals
- Electronics
- Pharmaceuticals
- Oil & gas
- Heat treatment
- Aviation
- Fire prevention
- Training and fitness



The Earth's Atmosphere

Prevents Oxidation



Prevents Bacterial Growth

Prevents Combustion and Explosion

Traditional Methods of Nitrogen Supply

Traditionally, nitrogen and other industrial gases have been delivered to users' sites by gas supply companies, in gas via high pressure cylinders or liquid via dewars or bulk storage tanks. This gas is produced through a process called cryogenic distillation, which is very expensive and consumes large amounts of energy.

With traditional methods of gas supply, users are responsible for 'hidden extra costs' such as cylinder rental, delivery and administration charges on top of the headline gas price. Additionally, traditional gas supply methods result in waste. Liquid 'boil-off' from dewars vents expensive gas into the atmosphere, and approximately 10% of the gas in every cylinder is returned to the supplier unused.

Even more important is that delivered gas is a safety hazard. High-pressure gas cylinders sit at pressures up to 3000 psi g (207 bar g) and require restraints when in storage. These high-pressure vessels must be manually handled when it's time for changeout, which requires personnel competence training.

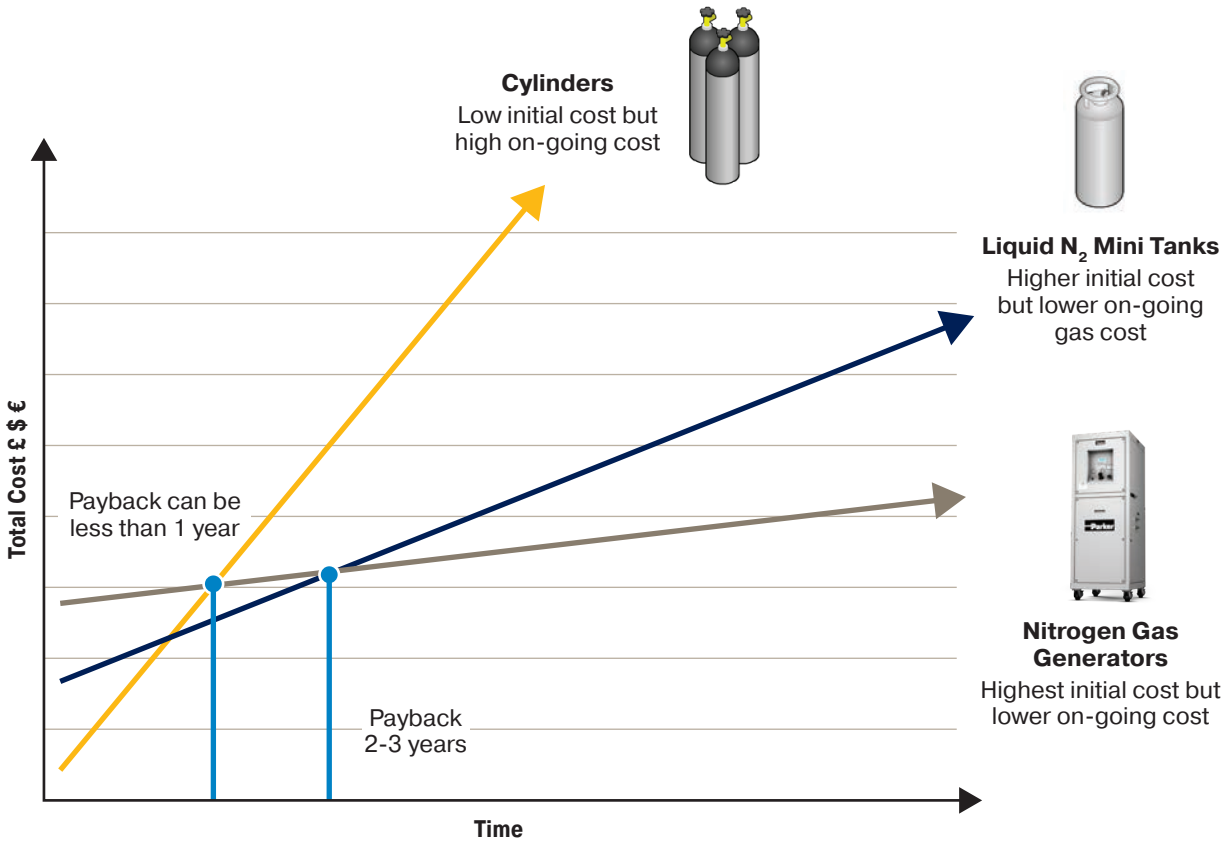
Liquid stored gas is no safer. If expelled into atmosphere, liquid nitrogen expands nearly 700 times in volume when it vaporizes and quickly displaces oxygen. If sufficient liquid nitrogen is vaporized into a confined space, there is risk of asphyxiation. The lack of properties, such as color or odor, risks significant harm with minimal warning.

The Benefits of Producing Nitrogen On-Site

Nitrogen generators allow users to safely produce a continuous supply of high-quality nitrogen on-site and on-demand. These gas generators take in air from a standard industrial compressor and sieve out oxygen and other trace gases, while nitrogen passes through to the application. As a result, companies can use as much or as little nitrogen as needed, at a fraction of the cost of having gas delivered by an external supplier.

There are two core technologies that are used in the on-site generation of nitrogen: hollow fiber membrane and pressure swing adsorption (PSA). While each of these technologies offer unique value proposition, both offer companies with a reliable system to provide exactly the right quality and amount of nitrogen gas for their application.

Nitrogen gas generators offer companies a more flexible, efficient, safe, and affordable alternative to gas delivered by a gas supply company. When the true costs are accounted for, nitrogen gas generation is the most economical source for producing nitrogen. Users who switch realize capital payback in a little as 12 months.



Membrane Nitrogen Generation Systems

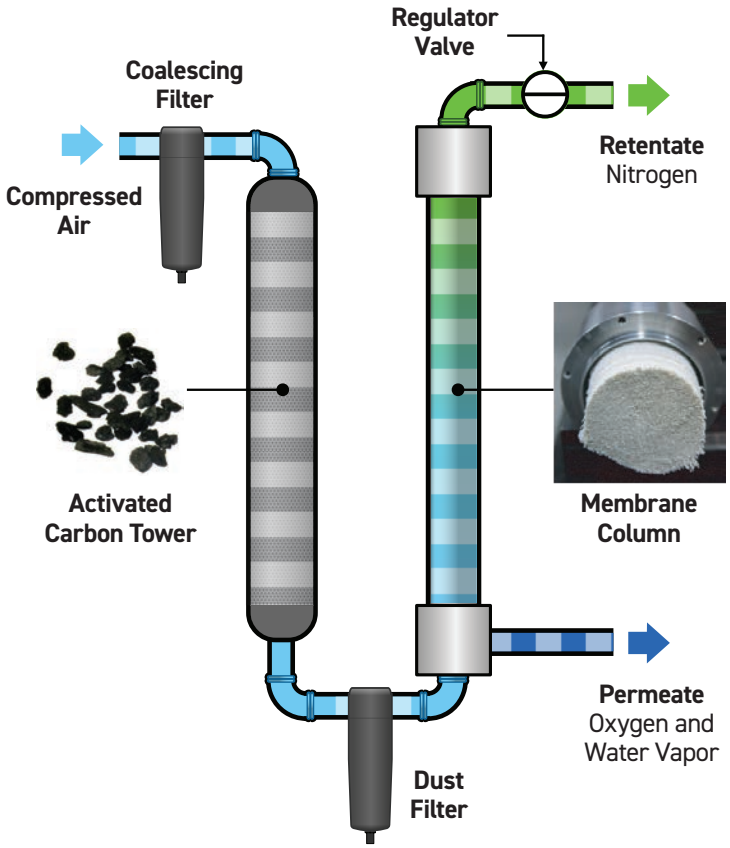
Membrane technology uses bundles of hollow fibers contained within a tube. The fiber walls selectively separate compressed air by diffusing unwanted oxygen, water vapor and other waste gases to atmosphere. Meanwhile, nitrogen is retained and allowed to pass through the center of the fibers to the application.

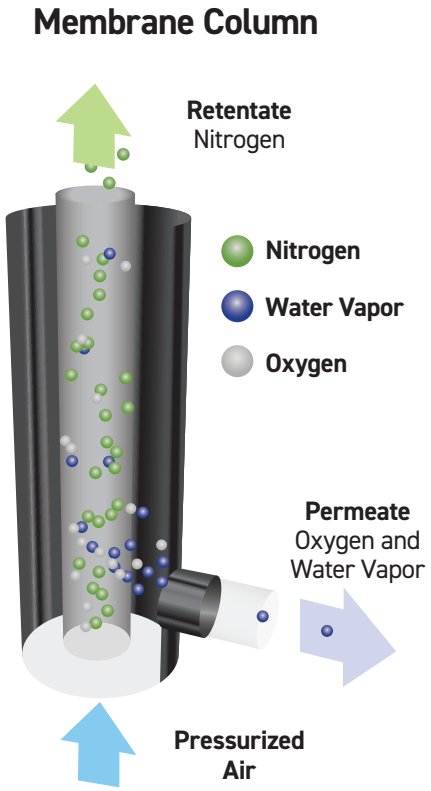
Membrane technologies typically produce nitrogen gas with purities of 95-99%, making them ideal for low purity applications. While limited from a purity standpoint, membranes have several strengths.

More nitrogen per fiber is produced from Parker membranes than any other in the world. Spun in a modern production facility, Parker has complete control over the quality of the fibers produced, leading to the most permeable, robust and energy efficient product on the market.

Strengths of Nitrogen Generation Systems

- Compact and light weight
- Easy to install
- Ideal 'plug and play' solution
- No electrical requirements
- Low service costs
- No need for air storage or nitrogen buffer vessels
- Instant purity at startup
- Easy to expand
- Silent operation





HFX Series Membrane Nitrogen Gas Generators

A range of comprehensive industrial membrane nitrogen generators that produce up to 99% pure, commercially sterile nitrogen from a standard compressed air supply at dewpoints down to -58˚F (-50˚C). Features and benefits include:

Reliable performance

- Deliver a continuous supply of high-quality nitrogen with purities ranging from 95 to 99%
- Immediate purity from system onset

Comprehensive design

- Complete with pre-filtration, including activated carbon filter for oil vapor removal
- Final filtration efficiency of 99.9999+% at 0.01µm
- Includes operating pressure gauges, nitrogen flow meter and outlet pressure regulator
- Flow control valve allows for field adjustable purity

Hassle-free design

- Compact design frees up valuable floor space
- Easy to install & operate

Cost savings

- No electrical requirements – unless fitted with optional O2 analyzer
- Lowest operating costs of any nitrogen generator technology
- Capital payback in as little as 12 months

Long System Lifetime

- Standard pre-filtration protects hollow membrane fibers and elongates performance
- No heater required

Safe and reliable

- Produce nitrogen from a standard supply of compressed air
- Eliminate manual handling and storage of high-pressure cylinders

HFX-11

Ideal for low purity applications where 1% to 5% remaining oxygen content is permissible. Such as:

- Chemical blanketing
- Fire & explosion prevention
- Pigging
- Tire inflation
- Laser sintering
- Dry boxes

Product Selection

Series	O2 Analyzer		-	Model		Example: HFXO-11
HFX	Blank	None		1	See Product Selection below for flow rates	
	O	Included		2		
				3		
				4		
				5		
				6		
				7		

Nitrogen Flow Rates in SCFH (Nm³/hr)

N2 Purity	95%	96%	97%	98%	99%
O2 Content	5%	4%	3%	2%	1%
HFX-1	40 (1.1)	33 (0.9)	26 (0.7)	16 (0.5)	11 (0.3)
HFX-3	148 (4.2)	120 (3.4)	95 (2.7)	70 (2.0)	42 (1.2)
HFX-5	279 (7.9)	229 (6.5)	176 (5.0)	131 (3.7)	76 (2.2)
HFX-7	452 (13)	360 (10)	283 (8.0)	209 (5.9)	120 (3.4)
HFX-9	752 (21)	600 (17)	452 (13)	330 (9.3)	201 (5.7)
HFX-11	1201 (34)	992 (28)	780 (22)	572 (16)	248 (7.0)

Flow Correction Factors

Psi g	58	73	87	101	116	130	145
Bar g	4	5	6	7	8	9	10
HFX-1	0.52	0.65	0.86	1.00	1.15	1.35	1.44
HFX-3	0.54	0.68	0.85	1.00	1.14	1.30	1.43
HFX-5	0.52	0.65	0.85	1.00	1.14	1.34	1.43
HFX-7	0.53	0.66	0.86	1.00	1.14	1.32	1.43
HFX-9	0.44	0.65	0.85	1.00	1.10	1.30	1.40
HFX-11	0.44	0.65	0.85	1.00	1.20	1.40	1.60

1. Flow Rates based on inlet of 100 psi g (7 bar g) and 68°F (20°C). Nitrogen generator purity is pressure, temperature, and flow dependent.
2. Higher flow and purities can be accomplished at higher pressures. Consult factory for assistance with sizing.

Technical Specifications

Model Number[1]	Min. Ambient Temperature	Max. Ambient Temperature	Min. Inlet Temperature	Max. Inlet Temperature	Min. Inlet Pressure	Max. Inlet Pressure	Max. Pressure Drop	Nitrogen Dewpoint	Power Supply
HFX-1	40°F (5°C)	95°F (35°C)	40°F (5°C)	100°F (38°C)	60 psi g (4 bar g)	145 psi g (10 bar g)	10 psi g (0.7 bar g)	-58°F (-50°C)	Without O2 analyzer: None
HFX-3				122°F (50°C)					
HFX-5									
HFX-7									With O2 analyzer: 120V-1Ph-60Hz 30 Watts
HFX-9							15 psi g (1.03 bar g)		
HFX-11							20 psi g (1.4 bar g)		

1. For HFX fitted with an analyzer, add "O" to part number after "HFX". For example: HFXO-11.
2. Pressure drop rating based on 95% N2 purity and inlet air pressure of 125 psi g.

Weights and Dimensions

Model Number	HFX-1	HFX-3	HFX-5	HFX-7, HFX-9, HFX-11
Dimensions (W x D x H)	12.8" x 7.5" x 18.8" (33cm x 19cm x 48cm)	18.0" x 16.2" x 51.5" (46cm x 42cm x 131cm)		26.3" x 20" x 69" (61cm x 51cm x175 cm)
Shipping Weight	38 lb (17.3 kg)	127 lb (58 kg)	138 lb (63 kg)	250 lb (114 kg)
Inlet/Outlet Port Sizes:	1/4" NPT			

1. Weights and dimensions shown for all models are approximate. Parker reserves the right to make changes without notification. Consult factory for general arrangement drawings.

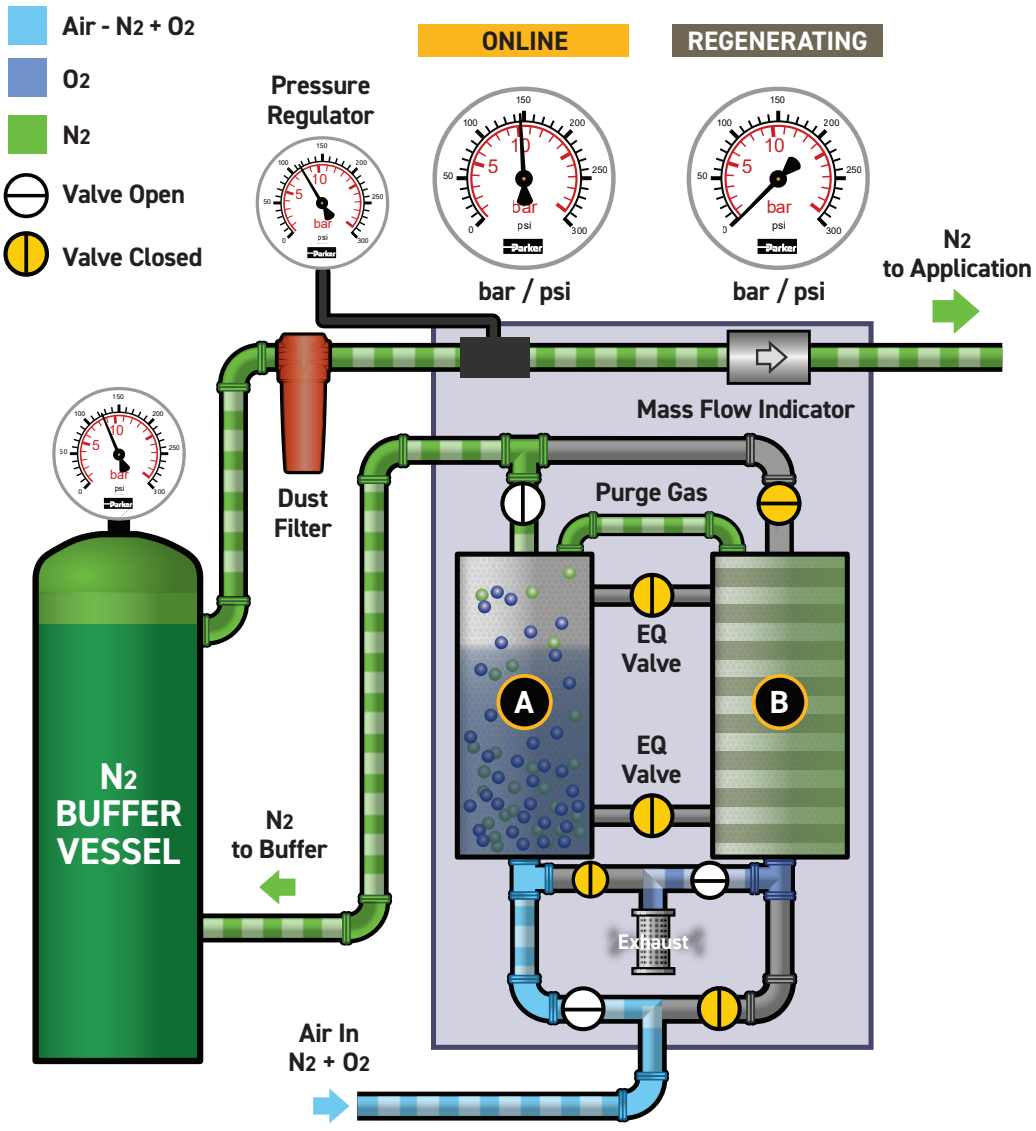
Pressure Swing Adsorption Nitrogen Generation Systems

Pressure Swing Adsorption (PSA) technology uses 2 vessels (or 2 sets of vessels) filled with carbon molecular sieve (CMS) to separate compressed air. Oxygen and other waste gases are selectively adsorbed under pressure by the CMS, allowing nitrogen to pass through to the application.

The CMS is regenerated by releasing the pressure in one of the vessels and venting the waste gases to atmosphere, while the other vessel(s) continues to separate air and deliver a continuous supply of nitrogen.

This process is called pressure swing adsorption because the operating pressure “swings” from atmospheric pressure to line pressure to adsorb oxygen and from line pressure to atmospheric pressure to desorb and release the waste gases.

PSA nitrogen gas generators can take a supply of compressed air and deliver nitrogen with purities up to 99.999% (10 ppm remaining oxygen content).



Typical PSA Nitrogen Gas Generator Configuration

Compressed air is generated from a compressor and is stored in a wet air receiver. A wet air receiver can act as a cooling device, reducing compressed air as much as 40˚F. This cooling causes condensation of oil and water vapors into liquid oil and water. Unfortunately, it also provides the ideal environment for the rapid growth of microorganisms.

Next, the compressed air flows through a water separator. Water separators are usually the first piece of compressed air purification equipment installed downstream of an after-cooler or wet air receiver and should be used to protect coalescing filters from liquid contamination. They will only reduce liquids and will have no effect on water or oil in an aerosol or vapor phase.

Following bulk condensate removal for the water separator, the compressed air is treated further by a set of coalescing filters. Coalescing filters remove particulates (atmospheric dust, rust and pipescale), microorganisms, oil aerosols and water aerosols.

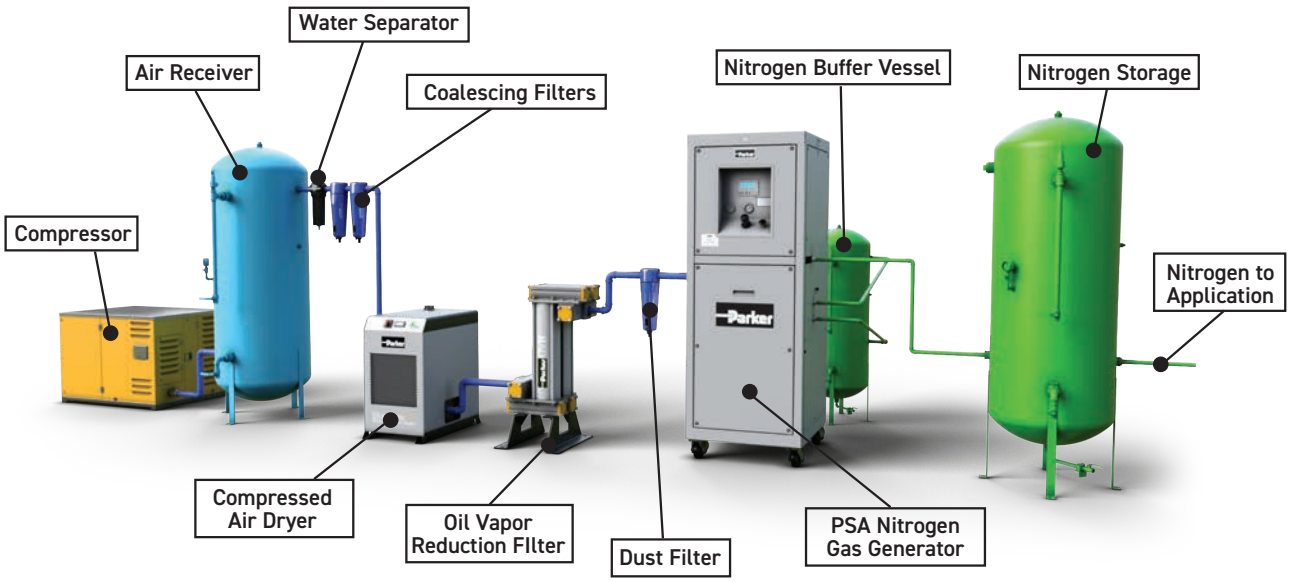
Next, a compressed air dryer is employed to remove water vapor from the air. Refrigerated dryers, which are more cost friendly, typically reduce water vapor down to a pressure dewpoint of around 40˚F. Desiccant dryers are more efficient at reducing water vapor, providing a pressure dewpoint of -40˚F or better, but come at a higher cost.

Once dried, the clean, dry compressed air then enters the nitrogen gas generator where oxygen and nitrogen are separated by molecular size using carbon molecular sieve (CMS). The waste oxygen and other unwanted trace gases are removed, and nitrogen gas is output to the application.

The carbon molecular sieve is continuously adsorbing and regenerating via a process called pressure swing adsorption (PSA). Carbon molecular sieve is not a consumable item and is installed for the service life of the generator.

With the appropriate combination of compressed air purification equipment installed and properly maintained, a PSA nitrogen generator can continuously provide clean, dry nitrogen gas with purities up to 99.999% (10 ppm remaining oxygen content) and dewpoints down to -58˚F.

Note: *Achieving a compressed air pressure dewpoint of -15˚F or lower stops corrosion and inhibits the growth of microorganisms, resulting in high quality, food grade compressed air. It is recommended that a desiccant dryer and an oil vapor reduction (carbon) filter be installed upstream of the generator for critical applications with higher gas purity requirements.*



MB Series Mono-Bed Nitrogen Gas Generators

A range of industrial PSA nitrogen generators that utilize a single bed of carbon molecular sieve to produce up to 99.99% pure, compressed nitrogen from a standard compressed air supply at dewpoints down to -58˚F (-50˚C). This unique design is tailored to applications that require medium to high nitrogen purity at lower flow rates. Features include:

Reliable performance

- Deliver a continuous supply of high-quality nitrogen with purities ranging from 95 to 99.99%
- Take control of your own nitrogen supply – never worry about downtime again

Comprehensive design

- High efficiency pre-filtration removes inlet air particles down to 0.1µm
- SS sterile air final filter provides outlet filtration efficiency of 99.9999+% at 0.01um and has full compliance with FDA and USDA requirements
- Includes operating pressure gauges, nitrogen flow meter, outlet pressure regulator and nitrogen buffer tank
- Flow control valve allows for field adjustable purity
- Fitted with a % or PPM oxygen analyzer & display as standard
- MB-1 through MB-3 allow for future expansion up to a MB-5

Hassle-free design

- Compact footprint frees up valuable floor space
- Plug-and-play – easy to install & operate

Cost savings

- Capital payback in as little as 12 months
- Optional Stand-By Mode feature saves money during periods of low or no demand

Long system lifetime

- Standard pre-filtration protects CMS media and elongates performance
- Minimal annual maintenance required

Safe and reliable

- Produce nitrogen from a standard supply of compressed air
- Eliminate manual handling and storage of high-pressure cylinders

MB-5

Ideal for medium to high nitrogen purity applications where 1% to 100ppm remaining oxygen content is permissible. Such as:

- Food & beverage packaging
- Blanketing of ingredients
- Beer dispense
- Oil sparging
- Brazing
- Injection molding

Product Selection

Series		-	Model		-	O2 Analyzer		Example: MB-3-PCT
MB	Mono-Bed		1	See Product Selection below for flow rates		PCT	Purities between 95-99.9%	
			2			PPM	Purities between 99.95-99.99%	
			3					

Nitrogen Flow Rates in SCFH (Nm^3/hr)

N2 Purity	99.99%	99.95%	99.9%	99.5%	99%	98%	97%	96%	95%
O2 Content	100 ppm	500 ppm	0.10%	0.50%	1%	2%	3%	4%	6%
MB-1-[*]	37 (1.1)	56 (1.6)	76 (2.2)	99 (2.8)	109 (3.1)	135 (3.8)	154 (4.4)	174 (4.9)	194 (5.5)
MB-3-[*]	74 (2.1)	110 (3.1)	152 (4.3)	197 (5.6)	218 (6.2)	270 (7.6)	309 (8.7)	349 (9.9)	388 (11.0)
MB-5-[*]	112 (3.2)	165 (4.7)	228 (6.5)	296 (8.4)	327 (9.3)	405 (11.5)	463 (13.1)	523 (14.8)	583 (16.5)

1. Flow Rates based on inlet of 110 psi g (7.6 bar g) and 77°F (25°C). Nitrogen generator purity is pressure, temperature, and flow dependent.
2. Higher flow and purities can be accomplished at higher pressures. Consult factory for assistance with sizing.

Technical Specifications

Model Number[1]	Min. Ambient Temperature	Max. Ambient Temperature	Min. Inlet Temperature	Max. Inlet Temperature	Min. Inlet Pressure	Max. Inlet Pressure	N2 Outlet Pressure[2]	Nitrogen Dewpoint	Power Supply
MB-1-[*]	40°F (5°C)	95°F (35°C)	60°F (16°C)	105°F (40°C)	80 psi g (5.5 bar g)	140 psi g (9.7 bar g)	80 psi g (5.5 bar g)	-58°F (-50°C)	120V-1Ph-60Hz 180 Watts
MB-3-[*]									
MB-5-[*]									

1. Replace [*] with “PCT” for percent analyzer (purities 95-99.9%) or “PPM” for parts per million analyzer (purities 99.95-99.99%).
2. Outlet pressure based on operating parameters of 110 psig inlet and 96-99.99% purity. Pressure to be 5-10 psig lower when operating at < 95% purity.

Weights and Dimensions

Model Number	Dimensions (W x D x H)	Shipping Weight	Buffer Tank (D x H)	Buffer Tank Volume	Inlet / Outlet Port Size
MB-1-[*]	29" x 27" x 77" (74 cm x 69 cm x 196 cm)	724 lb (328 kg)	24" x 53" (61 cm x 135 cm)	60 gal. (277 liters)	1/2" NPT
MB-3-[*]		766 lb (347 kg)			
MB-5-[*]		835 lb (379 kg)			

1. Weights and dimensions shown for all models are approximate. Parker reserves the right to make changes without notification. Consult factory for general arrangement drawings.

DB Series Dual-Bed Nitrogen Gas Generators

A range of comprehensive industrial PSA nitrogen generators that utilize 2 sets of carbon molecular sieve beds to produce up to 99.999% pure, compressed nitrogen from a standard compressed air supply at dewpoints down to -58˚F (-50˚C). These full-feature generators are the ideal choice for applications that require medium to high nitrogen purities at medium flow rates. Features include:

Wide range of nitrogen purities

- Produce nitrogen purities from 95 to 99.999% (5% to 10 ppm O2)
- Flow control valve allows for field adjustment of nitrogen purity

High flow capacity*

- Cabinet DB deliver N2 flow up to 2048 scfh @ 99.5%
- Twin tower DB deliver N2 flows up to 5445 scfh @ 99.5%

Portable and Expandable

- Cabinet DB units come fitted with casters for portability
- DB-5 through DB-10 can be purchased with expanded cabinet designs that allow for future expansion up to a DB-20

Integrated filtration

- High efficiency pre-filtration removes inlet air particles down to 0.1µm
- SS sterile air final filter provides outlet filtration efficiency of 99.9999+% at 0.01um and has full compliance with FDA and USDA requirements

Standard instrumentation

- Operating pressure gauges
- Nitrogen flow meter
- Percent O2 analyzer (95-99.95%)
- Parts per million (PPM) O2 analyzer (99.99-99.999%)
- Outlet pressure regulator

*Flow rates based on inlet of 110 psi g (7.6 bar g) and 77˚F (25˚C).

DB-5

Ideal for medium to high nitrogen purity applications where 1% to 10ppm remaining oxygen content is permissible. Such as:

- Heat treatment
- Pharmaceutical
- Food & beverage packaging
- Blanketing of ingredients
- Laser cutting
- Electronics manufacturing

Zirconia O2 sensor

- Highly accurate and reliable
- Unlimited shelf life without the loss of calibration
- 5-year life expectancy

Buffer tank included

- Included with all cabinet and twin tower DB units
- Ensure consistent nitrogen purity to your application

Standby Mode of Operation

- Monitors key system parameters and stops operation during times of no or low load

Unsurpassed carbon molecular sieve

- High packing density maximizes the amount of CMS installed in each vessel
- Delivers high purity nitrogen with extremely low air flow and pressure requirements
- Low air-to-nitrogen ratio results in lower operating costs

Take full control of your costs and nitrogen supply

- Continuously generate as much or as little nitrogen as you need – on demand
- Eliminate downtime caused by gas shortages or delayed shipments
- Never sign a long-term gas supply contract again

Save money

- Eliminate administrative, refill and transportation costs associated with delivered gas
- Generate nitrogen from a standard factory air compressor
- Lower your operating costs
- Capital payback in as little as 12 months

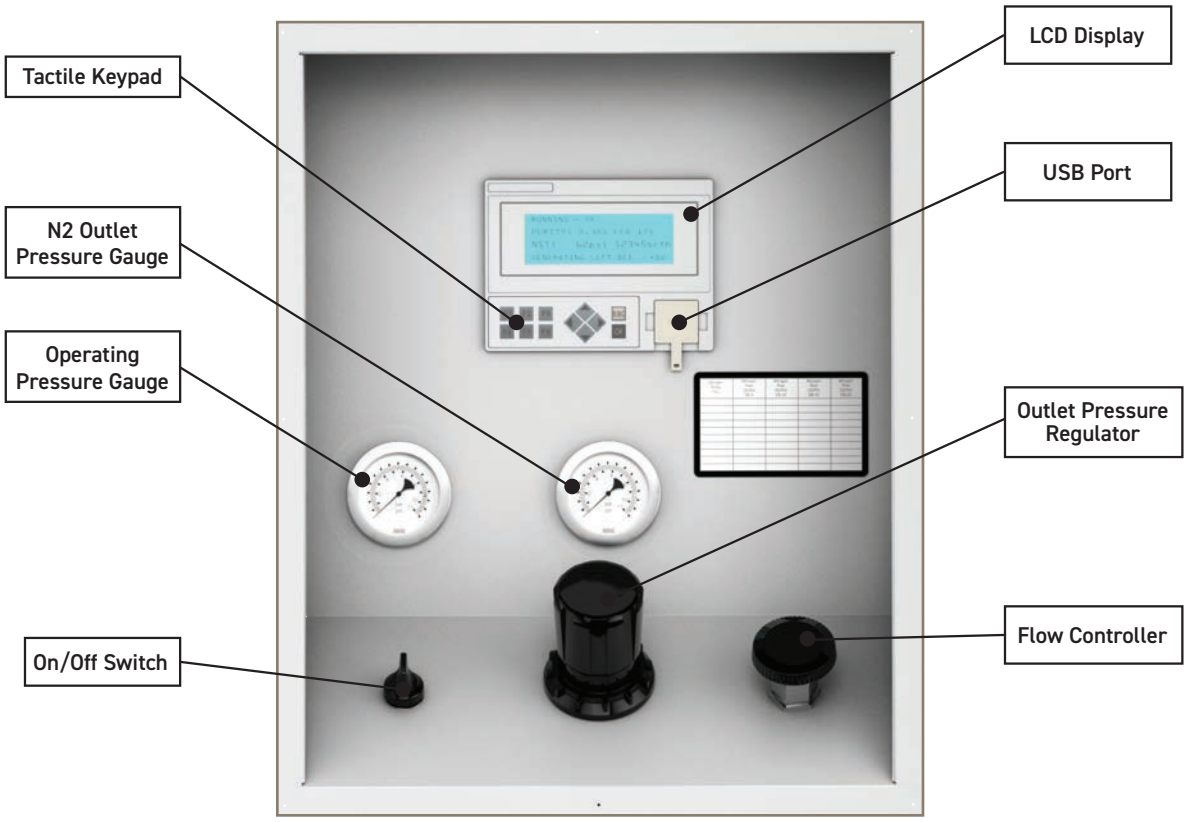
Long system lifetime

- Easy to maintain – minimal annual service requirements
- Integrated high-efficiency pre-filtration protects CMS media and elongates performance
- Operating life greater than 15 years

DB-80

DB-20 Cutaway

DB Series Advanced PLC Controls



Allen Bradley® PLC controls

- Equipped on all DB generators
- Industry-leading controls manufacturer
- Tailored for ease of operation

Allen Bradley® LCD display

- Easy-to-use tactile keypad
- 8 lines of text display

Main screen displays

- Operational status
- Oxygen content
- Nitrogen Flow rate
- Nitrogen buffer tank pressure
- Eco mode percentage
- Time remaining in cycle
- Run hours

Color changing backlight

- White backlight during normal operation
- Flashes red when oxygen sensor fails or if alarm is active

Communications

- Modbus TCP via Ethernet port, available as standard, allows for condition monitoring of all pertinent operational data
- Optional: 4-20mA for O2 purity

Alarms

- High O2 content warning & shutdown
- O2 sensor fault
- Flow sensor fault
- Pressure sensor fault
- Maintenance reminder

DB Series Dual-Bed Nitrogen Gas Generators – Cabinet

Product Selection

Series		-	Model		-	O2 Analyzer		-	Cabinet Type	
DB	Dual-Bed		5	See Product Selection below for flow rates		PCT	Purities between 95-99.9%		Blank	No extended cabinet
			10			PPM	Purities between 99.95-99.999%		EC	Extended cabinet (Models 5 & 10 only)
			15							
			20							

Example: DB-15-PPM

Nitrogen Flow Rates in SCFH (Nm³/hr)

N2 Purity	O2 Content	DB-5-[*]	DB-10-[*]	DB-10-[*]-EC	DB-15-[*]	DB-20-[*]
99.999%	10 ppm	94 (2.6)	189 (5.4)	189 (5.4)	283 (8.0)	377 (10.7)
99.995%	50 ppm	150 (4.2)	300 (8.5)	300 (8.5)	450 (12.7)	600 (17.0)
99.99%	100 ppm	194 (5.5)	388 (11.0)	388 (11.0)	583 (16.5)	777 (22.0)
99.95%	500 ppm	314 (8.9)	629 (17.8)	629 (17.8)	943 (26.7)	1258 (35.6)
99.9%	0.10%	365 (10.3)	730 (20.7)	730 (20.7)	1095 (31.0)	1460 (41.3)
99.5%	0.50%	512 (14.5)	1024 (29.0)	1024 (29.0)	1536 (43.5)	2048 (58.0)
99%	1%	618 (17.5)	1200 (34.0)	1200 (34.0)	1853 (52.5)	2470 (70.0)
98%	2%	770 (21.8)	N/A	1541 (43.6)	2311 (65.4)	3081 (87.2)
97%	3%	892 (25.3)	N/A	1783 (50.5)	2675 (75.75)	3566 (101.0)
96%	4%	983 (27.8)	N/A	1966 (55.7)	2949 (83.5)	3931 (111.3)
95%	5%	1065 (30.2)	N/A	2130 (60.3)	3195 (90.5)	4260 (120.6)

1. Flow Rates based on inlet of 110 psi g (7.6 bar g) and 77°F (25°C). Nitrogen generator purity is pressure, temperature, and flow dependent.
2. Higher flow and purities can be accomplished at higher pressures. Consult factory for assistance with sizing.

Technical Specifications

Model Number[1]	Min. Ambient Temperature	Max. Ambient Temperature	Min. Inlet Temperature	Max. Inlet Temperature	Min. Inlet Pressure	Max. Inlet Pressure	Max.Press. Drop	Nitrogen Dewpoint	Power Supply
DB-5-[*]	40°F (5°C)	95°F (35°C)	60°F (16°C)	105°F (40°C)	80 psi g	140 psi g	30 psi d (2 bar d)	-58°F	120V-1Ph-60Hz 180 Watts
DB-10-[*]									
DB-15-[*]									
DB-20-[*]									

1. Replace [*] with “PCT” for percent analyzer (purities 95-99.9) or “PPM” for parts per million analyzer (purities 99.95-99.999%).
2. Only DB-5 and DB-10 models can be purchased with Extended Cabinet (-EC) option. Allows for expansion into a DB-20.

Weights and Dimensions

Model Number	DB-5-[*]	DB-10-[*]	DB-15-[*]	DB-20-[*]
Dimensions (W x D x H)	28.6” x 33.6” x 79.6” 73 cm x 86 cm x 203 cm		28.8” x 51.6” x 78.6” 74 cm x 132 cm x 200 cm	
Shipping Weight	1065 lb (483 kg)	1265 lb (574 kg)	1553 lb (705 kg)	1753 lb (795 kg)
Inlet/Outlet Port Size	1/2” NPT / 1/2” NPT		1” NPT / 3/4” NPT	
Nitrogen Buffer Tank	60 gal (277 liters) | 24”D x 53”H (61 cm x 135 cm)			

1. Weights and dimensions shown for all models are approximate. Parker reserves the right to make changes without notification. Consult factory for general arrangement drawings.
2. For DB-10-[*]-EC model: use dimensions and port size of DB-20-[*] and weights of DB-10-[*].

DB Series Dual-Bed Nitrogen Gas Generators – Twin Tower

Product Selection

Series		-	Model		-	O2 Analyzer		Example: DB-50-PPM
DB	Dual-Bed		30	See Product Selection below for flow rates		PCT	Purities between 95-99.9%	
			40			PPM	Purities between 99.95-99.999%	
			50					
			80					

Nitrogen Flow Rates in SCFH (Nm³/hr)

N2 Purity	O2 Content	DB-30-[*]	DB-40-[*]	DB-50-[*]	DB-80-[*]
99.999%	10 ppm	552 (14.5)	656 (17.2)	864 (22.7)	1381 (36.3)
99.995%	50 ppm	715 (18.8)	847 (22.3)	1115 (29.3)	1783 (46.9)
99.99%	100 ppm	1010 (26.6)	1198 (31.5)	1578 (41.5)	2525 (66.4)
99.95%	500 ppm	1365 (35.9)	1622 (42.6)	2135 (56.1)	3417 (89.8)
99.90%	0.10%	1530 (40.2)	1812 (47.6)	2390 (62.8)	3818 (100.4)
99.50%	0.50%	2178 (57.3)	2585 (68.0)	3402 (89.4)	5445 (143.1)
99%	1%	2270 (59.7)	2690 (70.7)	3545 (93.2)	5670 (149.1)
98%	2%	2950 (77.5)	3505 (92.1)	4615 (121.3)	7385 (194.1)
97%	3%	3190 (83.9)	3780 (99.4)	4980 (130.9)	7960 (209.3)
96%	4%	3945 (103.7)	4680 (123.0)	6157 (161.9)	9845 (258.8)
95%	5%	4320 (113.6)	5140 (135.10)	6765 (177.8)	10815 (284.3)

1. Flow Rates based on inlet of 110 psi g (7.6 bar g) and 77˚F (25˚C). Nitrogen generator purity is pressure, temperature, and flow dependent.
2. Higher flow and purities can be accomplished at higher pressures. Consult factory for assistance with sizing.

Technical Specifications

Model Number[1]	Min. Ambient Temperature	Max. Ambient Temperature	Min. Inlet Temperature	Max. Inlet Temperature	Min. Inlet Pressure	Max. Inlet Pressure	Max.Press. Drop	Nitrogen Dewpoint	Power Supply
DB-30-[*]	40˚F (5˚C)	95˚F (35˚C)	60˚F (16˚C)	105˚F (40˚C)	80 psi g (5.5 bar g)	140 psi g (9.7 bar g)	30 psi d (2 bar d)	-58˚F (-50˚C)	120V-1Ph-60Hz 300 Watts
DB-40-[*]									
DB-50-[*]									
DB-80-[*]									

1. Replace [*] with “PCT” for percent analyzer (purities 95-99.9%) or “PPM” for parts per million analyzer (purities 99.95-99.999%).

Weights and Dimensions

Model Number	DB-30-[*]	DB-40-[*]	DB-50-[*]	DB-80-[*]
Dimensions (W x D x H)	64.0” x 64.0” x 90.3” (163cm x 163cm x 230cm)		64.0” x 64.0” x 92.8” (163cm x 163cm x 236cm)	64.0” x 64.0” x 103.8” (163cm x 163cm x 264cm)
Shipping Weight	3718 lbs (1686 kg)	4018 lbs (1823 kg)	4635 lbs (2102 kg)	5780 lbs (2622 kg)
Inlet/Outlet Port Size	1-1/2” NPT / 1” NPT	2” NPT / 1” NPT	2” NPT / 1-1/2” NPT	
Nitrogen Buffer Tank	240 Gal. (909 L) 30.2”W x 41.0”D x 94.0”H (77cm x 104cm x 239cm)		400 Gal. (1514 L) 39.4”W x 45.0”D x 102.2”H (100cm x 115cm x 260cm)	660 Gal. (2498 L) 48.4”D x 51.3”W x 126.8”H (123cm x 131cm x 322cm)

1. Weights and dimensions shown for all models are approximate. Parker reserves the right to make changes without notification. Consult factory for general arrangement drawings.

Custom Twin Tower PSA Nitrogen Gas Generator Solutions

Customization

For nitrogen flow rates that exceed those of our standard twin tower DB generators, Parker offers custom PSA nitrogen generation systems, which are customizable - our team of engineers will work with you to meet your specific requirements.

Energy Efficient Control System

Traditional PSA systems operate under a fixed time cycle even when customer nitrogen demand is low. This is very wasteful since it requires compressors to continuously produce large amounts of air to feed the generator. The Energy Efficient Control System (EECS) utilizes an integrated nitrogen flow meter to monitor customer demand of nitrogen. During periods of low demand, the time cycle will automatically be extended. This results in a reduced compressed air requirement, providing energy and cost savings. As an added benefit, this feature elongates valve life by reducing the number times valves must switch.

Standby Mode

Separate from the EECS controls is a Standby Mode feature. During times of no demand, the control system detects a no flow condition which results in the generator entering Standby Mode. By shutting down the nitrogen generator, the air compressors will not continue to run unnecessarily. Like EECS, this saves energy, results in lower operating costs, and reduces wear on valves. Once the control system detects nitrogen flow, the system automatically starts back up and seamlessly resumes nitrogen production.

Differential Pressure Bed Monitoring

Differential pressure indicators are included to allow the user to monitor excessive differential pressures across the bed. This is important since high differential pressures can lead fluidization of the carbon molecular sieve (CMS) inside the adsorption vessels.

Optimized L/D Ratios

Our CMS beds are sized to maintain a specific length-to-diameter (L/D) ratio. Proper L/D is critical to prevent feed gas channeling making the nitrogen separation process inefficient. Optimum L/D is calculated to minimize the channeling effect so maximum bed surface area is realized.

Valve Leak Check

Incorporated in each custom PSA system is a Valve Leak Check feature, which allows the user to determine valve seat health without having to remove the valves from the process. Valve Leak Check can be performed and completed in less than 10 minutes and makes troubleshooting a breeze.

Bed Design

Unlike competitors who use fully welded heads, our adsorption vessels utilize an ASME flange which can be removed. This allows users to easily replace the CMS media if it becomes contaminated.

WineMaker Series Dual-Bed Nitrogen Gas Generators

The global wine market has never been more competitive, and customer expectations have never been higher. Facing a world of choice, buyers in the wine industry are increasingly turning to familiar brands for the reassurance of consistent quality, taste and affordability. The challenge for producers is to supply consumers' favorite wines at the volume and cost required while ensuring that taste, character and enjoyment remain undiluted.

From fermentation to bottling, nitrogen has an important role to play in modern winemaking. Nitrogen is used for purging or blanketing tanks, racking barrels, flushing bottles, and at any point where the wine comes in contact with air.

Nitrogen generation provides a reliable source of nitrogen at the lowest total cost available. Generating your own nitrogen eliminates the hassles of supplied cylinders, dewars or bulk nitrogen.

Parker offers a range of technically advanced, energy efficient and reliable solutions for the wine making industry. The WineMaker Series is a range of full-feature industrial PSA nitrogen generators that provide up to 99.99% nitrogen at dewpoints down to -58˚F (-50˚C). Since inception, Parker WineMaker generators have become a staple for wine production in North America and are installed in hundreds of wineries from coast to coast.

DB-5-PCT-W

Application Highlight: Wine Bottling

Bottle Flushing: Flushing a bottle with nitrogen reduces oxygen concentration prior to filling, and reduces water usage, making it much more effective treatment than sterilization alone.

Sparging: Oxygen pick-up from entrained air is a significant problem during the bottling process. Bubbling nitrogen through wine mitigates dissolved oxygen (DO) pickup.

Blanketing: Filling headspace in storage vessels, including bottles, with nitrogen is a highly effective way of minimizing contact between oxygen and the wine surface. This prevents oxidation and protects against spoilage.

Product Selection

Technology		Model		O2 Analyzer		Series		Example
DB	Dual Bed	5 10 15 20	See Product Selection below for flow rates	PCT	Percent Analyzer	W	WineMaker	DB-10-PCT-W

N2 Purity	O2 Content	DB-5-PCT-W	DB-10-PCT-W	DB-15-PCT-W	DB-20-PCT-W
99.9%	0.10%	365 (10.3)	730 (20.7)	1095 (31.0)	1460 (41.3)
99.5%	0.50%	512 (14.5)	1024 (29.0)	1536 (43.5)	2048 (58.0)
99%	1%	618 (17.5)	1200 (34.0)	1853 (52.5)	2470 (70.0)
98%	2%	770 (21.8)	1541 (43.6)*	2311 (65.4)	3081 (87.2)
97%	3%	892 (25.3)	1783 (50.5)*	2675 (75.75)	3566 (101.0)
96%	4%	983 (27.8)	1966 (55.7)*	2949 (83.5)	3931 (111.3)
95%	5%	1065 (30.2)	2130 (60.3)*	3195 (90.5)	4260 (120.6)

1. Flow Rates based on inlet of 110 psi g (7.6 bar g) and 77°F (25°C). Nitrogen generator purity is pressure, temperature, and flow dependent.
2. Higher flow and purities can be accomplished at higher pressures. Consult factory for assistance with sizing.
* Flow rate available only with the DB-10-PCT-EC (extended cabinet) model.

Technical Specifications

Model Number	Min. Ambient Temperature	Max. Ambient Temperature	Min. Inlet Temperature	Max. Inlet Temperature	Min. Inlet Pressure	Max. Inlet Pressure	Max. Press. Drop	Nitrogen Dewpoint	Power Supply
DB-5-PCT-W DB-10-PCT-W DB-15-PCT-W DB-20-PCT-W	40°F (5°C)	95°F (35°C)	60°F (16°C)	105°F (40°C)	80 psi g	140 psi g	30 psi d (2 bar d)	-58°F	120V-1Ph-60Hz 180 Watts

Weights and Dimensions

Model Number	DB-5-PCT-W	DB-10-PCT-W	DB-15-PCT-W	DB-20-PCT-W
Dimensions (W x D x H)	28.50" x 32.25" x 77.75" (72.3 cm x 81.9 cm x 197.5 cm)	28.50" x 32.25" x 77.75" (72.3 cm x 81.9 cm x 197.5 cm)	28.50" x 51.50" x 77.75" (72.3 cm x 130.8 cm x 197.5 cm)	28.50" x 51.50" x 77.75" (72.3 cm x 130.8 cm x 197.5 cm)
Shipping Weight	1065 lb (483 kg)	1265 lb (574 kg)	1553 lb (705 kg)	1753 lb (795 kg)
Inlet/Outlet Port Size	1/2" NPT / 1/2" NPT		1" NPT / 3/4" NPT	
Nitrogen Buffer Tank	60 gal (277 liters) 24"D x 53"H (61 cm x 135 cm)			

1. Weights and dimensions shown for all models are approximate. Parker reserves the right to make changes without notification. Consult factory for general arrangement drawings.

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