

# Food Processing and Packaging

Market Application Publication



## Background:

Final product quality is the most important aspect of food manufacturing. Customers expect freshness and consistent taste every time they open a new package of food. Bacteria growth in the final package reduces shelf life, and ultimately leads to an unsatisfied customer. Packaging with dry nitrogen will minimize oxygen and remedy these issues, providing a better customer experience.



## Features and Benefits:

- Price of our nitrogen is constant. Supplier Nitrogen is subject to pricing increases, rental agreements, hazmat fees, delivery surcharges, local & state taxes, etc. A nitrogen generator offers long term price stability.
- Your cost increases relative to usage with bulk, dewar or cylinder nitrogen. Costs decrease as usage increases with a nitrogen generator.
- Nitrogen has a very low boiling point, and is continuously evaporating when supplied as liquid in bulk or dewars. It can cost thousands of dollars if these gases are not recaptured.
- A nitrogen generator eliminates the contracts required from bulk gas suppliers. No more automatic renewals, automatic increases or 1-year written notice for contract termination.
- Ease of installation. Pipe in compressed air and pipe out Nitrogen. Contrast this with the installation requirements for a bulk tank, including a concrete pad, fence and significant square footage.
- Complete start up and testing procedure at the factory prior to delivery.
- Very little maintenance or monitoring required once system is up and running. Simple and straightforward operation.
- Proven technology with numerous references available. Over 10,000 successful generator installations.
- Improves food quality by eliminating oxygen, moisture, and all other contaminants within packages .
- Extends product shelf life and ensures original product quality and integrity

## Application:

Oxygen and moisture in a package can promote bacteria growth, leading to spoilage, inconsistent flavors, poor product quality and an overall bad customer experience. Dry nitrogen is commonly used in both modified atmosphere and controlled atmosphere packaging to displace oxygen, ultimately minimizing bacteria growth, extending shelf life and improving product quality. While final packaging specifications will vary by product, a 2% O<sub>2</sub> concentration in the final package is typically enough to realize these benefits. Packaging with nitrogen has become the preferred technology because it is economical and “inert”. A Parker Balston Nitrogen Generator, which separates nitrogen and oxygen from a compressed air supply, can often be the most economical method to supply this nitrogen.

## Case Study:

Maidstone Coffee (Rochester, NY) uses nitrogen during the packaging process to provide a sterile, controlled environment for their product. Packaging in this manner delivers the highest possible quality, taste and freshness, and extends the shelf-life of the product. If nitrogen is not used during packaging operations, mold growth, moisture migration, product degradation and insect infestation can occur. Maidstone Coffee utilizes Parker Balston Nitrogen Generators to provide the nitrogen for their packaging operations. Every coffee package is flushed with nitrogen to ensure product integrity and maximize the shelf life of the products. The nitrogen generator meets all variable flow & purity control needs for Maidstone, with an outstanding record of uptime performance. A Parker Balston Nitrogen Generator ensures

that Maidstone Coffee continues to produce high-quality food products that meet the demands and expectations of its customers.



# Specifications and Ordering Information:

## Flow Rates (SCFH)

% Nitrogen	DB-5	DB-10	DB-15	DB-20	DB-1200	DB-1600	DB-1900	DB-2500	DB-4000
99.999	33	66	99	132	186	248	295	389	622
99.995	74	148	222	296	522	696	826	1088	1741
99.99	141	281	421	561	630	840	997	1312	2100
99.95	204	409	613	817	951	1268	1505	1981	3170
99.9	240	480	720	960	1077	1435	1703	2243	3590
99.5	345	689	1034	1378	1635	2178	2585	3402	5445
99	416	831	1247	1663	1995	2652	3150	4150	6640
98	499	998	1496	1995	2445	3250	3860	5088	8138
97	570	1140	1710	2280	2800	3732	4430	5836	9330
96	630	1259	1889	2518	3050	4066	4540	5984	9574
95	694	1387	2081	2774	3300	4400	5220	6880	11010

## Principal Specifications - Models DB-5, DB-10, DB-15, DB-20

Model Number	DB-5, DB-10	DB-15, DB-20
Feed Pressure	110 psig	110 psig
Temperature	80°F	80°F
Ambient Pressure	1 Atm.	1 Atm.
Maximum Pressure	140 PSIG	140 PSIG
Temperature Range	60°F - 105°F	60°F - 105°F
Dewpoint	40°F atmospheric dewpoint or better	40°F atmospheric dewpoint or better
Residual Oil Content	Trace	Trace
Particles	<.01 micron	<.01 micron
Atmospheric Dewpoint	-58°F (-50°C)	-58°F(-50°C)
Commercially Sterile	Yes	Yes
Particles >.1 micron	None	None
Suspended Liquids	None	None
Recommended Inlet Pressure (Min.)	110 psig (7.6 barg)	110 psig (7.6 barg)
Max Inlet Pressure	140 psig (9.7 barg)	140 psig (9.7 barg)
Max Outlet Pressure (Based on nominal conditions and standard 60 gallon nitrogen tank)	80 psig	DB-15: 80 psig @ 95-99.99% Purity DB-20: 80 psig @ 98-99.99% Purity 75 psig @ 97% Purity 70 psig @ 95-96% Purity
Min. / Max. Ambient Temperature	40°F/95°F (4°C/35°C)	40°F/95°F (4°C/35°C)
Dimensions	28.5"L x 32.25"D x 78"H	28.5"L x 50"D x 78"H
Weight (with tank)	620 lbs (DB-5), 830 lbs (DB-10)	1240 lbs (DB-15), 1450 lbs (DB-20)
Inlet/Outlet	1/2" NPT/ 1/2" NPT	1" NPT/3/4" NPT
Electrical Requirement	120VAC/60Hz, 1.5 Amp	120VAC/60Hz, 1.5 Amp

## Principal Specifications - Models DB-1200, DB-1600, DB-1900, DB-2500 and DB-4000

Dual Bed Nitrogen Generator	DB-1200	DB-1600	DB-1900	DB-2500	DB-4000
Atmospheric Dewpoint	-58°F (-50°C)	-58°F (-50°C)	-58°F (-50°C)	-58°F (-50°C)	-58°F (-50°C)
Particles > .1 micron	None	None	None	None	None
Suspended Liquids	None	None	None	None	None
Recommended Inlet Pressure	110 psig (7.6 barg)	110 psig (7.6 barg)	110 psig (7.6 barg)	110 psig (7.6 barg)	110 psig (7.6 barg)
Max Outlet Pressure	80 psig	80 psig	80 psig	80 psig	80 psig
Min/Max Ambient Temperature	40°F/95°F (4°C/35°C)	40°F/95°F (4°C/35°C)	40°F/95°F (4°C/35°C)	40°F/95°F (4°C/35°C)	40°F/95°F (4°C/35°C)
Inlet Port Size	1-1/2" NPT (female)	1-1/2" NPT (female)	2" NPT (female)	2" NPT (female)	2" NPT (female)
Outlet Port Size	1" NPT (female)	1" NPT (female)	1-1/2" NPT (female)	1-1/2" NPT (female)	1-1/2" NPT (female)
Electrical Requirements	120VAC/60 Hz	120VAC/60 Hz	120VAC/60 Hz	120VAC/60 Hz	120VAC/60 Hz
Dimensions	78"w x 48"d x 98"h (198cmx122cmx254cm)	78"w x 48"d x 92"h (198cmx122cmx234cm)	72"w x 54"d x 101"h (183cmx137cmx257cm)	72"w x 54"d x 125"h (183cmx137cmx318cm)	84"w x 72"d x 138"h (213cmx183cmx351cm)
Shipping Wt.	3,800 lbs. (1,724 kg)	3,800 lbs. (1,724 kg)	4,300 lbs. (1,951 kg)	6,500 lbs. (2,948 kg)	7,100 lbs. (3,221 kg)

# Specifications and Ordering Information:

## HFX Series Flow Rates and Pressure Correction

Flow Rates (SCFH) @ 100 psig @ 68°F							Pressure Correction Factors (at Indicated Operating Pressure (PSIG))									
Model	95	96	97	98	99	99.5	58	73	87	101	116	130	145	160	174	190
HFX-1	40	33	26	16	11	---	.52	.65	.86	1	1.15	1.35	1.44	---	---	---
HFX-3	148	120	95	70	42	---	.54	.68	.85	1	1.14	1.3	1.43	---	---	---
HFX-5	279	229	176	131	76	---	.52	.65	.85	1	1.14	1.34	1.43	---	---	---
HFX-7	452	360	283	209	120	---	.53	.66	.86	1	1.14	1.32	1.43	---	---	---
HFX-9	752	600	452	330	201	---	.44	.65	.85	1	1.1	1.3	1.4	---	---	---
HFX-11	1201	992	780	572	248	---	.44	.65	.85	1	1.2	1.4	1.6	---	---	---



## Principal Specifications - HFX Series Membrane Nitrogen Generators

Model Number	HFX-1, HFX0-1	HFX-3, HFX0-3	HFX-5, HFX0-5	HFX-7, HFX0-7, HFX-9, HFX0-9, HFX-11, HFX0-11
Atmospheric Dewpoint	-58°F (-50°C)	-58°F (-50°C)	-58°F (-50°C)	-58°F (-50°C)
Commercially Sterile	Yes	Yes	Yes	Yes
Particles > 0.01 micron	None	None	None	None
Suspended Liquids	None	None	None	None
Min/Max Operating Press.(1)	60 psig/145 psig	60 psig/145 psig	60 psig/145 psig	60 psig/145 psig
Max. Press. Drop (at 95% N <sub>2</sub> , 125 psig)	10 psig	10 psig	10 psig	10 psig
Recommended Ambient Operating Temperature	77°F (25°C)	77°F (25°C)	77°F (25°C)	77°F (25°C)
Min/Max Inlet Air Temp.	40°F/122°F (2°C/50°C)	40°F/122°F (2°C/50°C)	40°F/122°F (2°C/50°C)	40°F/122°F (2°C/50°C)
Recommended Inlet Air Temperature	77°F (25°C)	77°F (25°C)	77°F (25°C)	77°F (25°C)
Electrical Requirements (2)	None (2)	None (2)	None (2)	None (2)
Dimensions	12.8" w x 7.5" d x 16.3" h (32cm x 19.1cm x 41cm)	16" w x 16" d x 50" h (41cm x 25cm x 91cm)	16" w x 16" d x 50" h (41cm x 25cm x 91cm)	24" w x 20" d x 69" h (61cm x 51cm x 175cm)
Shipping Wt.	38 lbs. (17.3 kg)	75 lbs. (34 kg)	106 lbs. (114 kg)	250 lbs. (114 kg)

**Notes:**

1 Maximum operating pressure in Europe is 8 barg.

2 No electrical power required unless used with an electrical accessory, e.g., an oxygen analyzer.

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