Chemical Tank Blanketing

Market Application Publication

Background:

It is common during industrial manufacturing to use a variety of chemicals at various points in the manufacturing process. These chemicals can be very sensitive to their environment and/or extremely dangerous. A nitrogen blanket is commonly used to ensure the chemical's integrity and minimize flammability or explosivity concerns. This protection is necessary to preserve chemicals, maintain their useful life and guarantee safety.

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.
- Maintain chemical integrity with "inert" N2 Atmosphere.
- 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.
- Improve safety by minimizing flammability concern.

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Application:

Tank blanketing, or "padding", is the application of covering a chemical surface with nitrogen gas in order to protect a product from contamination, degradation, or chemical change. Introducing nitrogen, at a low pressure (typically less than 10 psig) and purity (typically 95-99.5%) will displace oxygen & water vapor, and maintaining this positive pressure prevents the ingression of ambient air (and oxygen). This nitrogen blanket is also used to balance tank volumes, minimizing any fluctuations due to changes in temperature, and to prevent a vacuum during discharge, averting any catastrophic storage tank collapse. 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:

A major paint manufacturer in North America had long utilized Parker Balston Nitrogen Generators to blanket select solvents at their facility. Outlet pressure was very low and they preferred 98% nitrogen purity, even though 95% purity is usually acceptable for solvent blanketing. This significantly improved facility safety and minimized flammability concerns, but was never instituted as standard practice. Ultimately there was a tank fire in one section of the facility that did not utilize a nitrogen pad, causing significant damage, downtime and lost revenue. Fortunately there were no injuries. The importance of nitrogen blanketing was soon realized, and it was instituted as standard practice throughout their North American facilities. Parker Balston was identified as a preferred supplier, as a nitrogen generator is a cost efficient method of inerting the headspace in a tank to ensure chemical integrity and product quality, while prolonging useful life.

Specifications and Ordering Information:

Standard Package Includes:

- Fully enclosed cabinet with casters
- High efficiency coalescing and sterile air filters
- Oxygen analyzer available
- High oxygen alarms and dry contacts available
- Stand by mode
- Purity easily adjusted between 95%-99.999% with flow control valve
- Outlet pressure regulator
- 60 gal. vertical nitrogen storage tank

Principal Specifications - Models DB5, DB-10, DB-15, DB-20

Model Number	DB-5	DB-10	DB-15	DB-20
Feed Air Pressure (minimum)	110 psig	110 psig	110 psig	110 psig
Air Quality	Clean air without contaminants	Clean air without contaminants	Clean air without contaminants	Clean air without contaminants
Temperature	80°F	80°F	80°F	80°F
Electrical Requirements	120 VAC /lph / 60Hz	120 VAC /lph / 60Hz	120 VAC /lph / 60Hz	120 VAC /lph / 60Hz
Maximum Pressure	140 PSIG	140 PSIG	140 PSIG	140 PSIG
Temperature Range	60°F - 105°F	60°F - 105°F		
Nitrogen Dewpoint	-58°F (-50°C)	-58°F (-50°C)	-58°F (-50°C)	-58°F (-50°C)
Commercially Sterile	Yes	Yes	Yes	Yes
Filtration Efficiency	99.99% @ 0.01u	99.99% @ 0.01u	99.99% @ 0.01u	99.99% @ 0.01u
Suspended Liquids	None	None	None	None
Ambient Pressure	Atmospheric	Atmospheric	Atmospheric	Atmospheric
Dimensions	28.5"L x 32.25"D x 78"H	28.5"L x 32.25"D x 78"H	28.5"L x 51.5"D x 78"H	28.5"L x 51.5"D x 78"H
Weight (with tank)	625 lbs	835 lbs	1245 lbs	1455 lbs
Inlet	1/2" NPT	1/2" NPT	1" NPT	1" NPT
Outlet	1/2" NPT	1/2" NPT	3/4" NPT	3/4" NPT

N2 Flow Rates (SCFH)

% N2	DB-5	DB-10	DB-15	DB-20
99.99	194	388	583	777
99.95	314	629	943	1258
99.9	365	730	1095	1460
99.5	512	1024	1536	2048
99	618	1235	1853	2470
98	770	1541	2311	3081
97	892	1783	2675	3566

Ordering Information - Models DB5, DB-10, DB-15, DB-20

Dual Bed N2 Generator with O2 Analyzer	DBO-5	DBO-10	DBO-15	DBO-20
Dual Bed N2 Generator w/o O2 Analyzer	DB-5	DB-10	DB-15	DB-20
Maint. Kit for N2 Generator with O2 Analyzer	MKDBO-5	MKDBO-5	MKDBO-15	MKDBO-15
Maint. Kit for N2 Generator w/o O2 Analyzer	MKDB5	MKDB5	MKDB15	MKDB15
Oxygen Sensor	72695	72695	72695	72695

Specifications and Ordering Information:

HFX Series Flow Rates and Pressure Correction

Flow Rates (SCFH) @ 100 psig @ 68°F

Model	95	96	97	98	99
HFX-1	40	33	26	16	11
HFX-3	148	120	95	70	42
HFX-5	279	229	176	131	76
HFX-7	452	360	283	209	120
HFX-9	752	600	452	330	201
HFX-11	1201	992	780	572	248

Pressure Correction Factors (at Indicated Operating Pressure (PSIG)

58	73	87	101	116	130	145
.52	.65	.86	1	1.15	1.35	1.44
.54	.68	.85	1	1.14	1.3	1.43
.52	.65	.85	1	1.14	1.34	1.43
.53	.66	.86	1	1.14	1.32	1.43
.44	.65	.85	1	1.1	1.3	1.4
.44	.65	.85	1	1.2	1.4	1.6

Principal Specifications - HFX Series Membrane Nitrogen Generators

Model Number	HFX-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 (4 barg/10 barg) (1)	60 psig/145 psig (4 barg/10 barg) (1)	60 psig/145 psig (4 barg/10 barg) (1)	60 psig/145 psig (4 barg/10 barg) (1)
Max. Press. Drop (at 95% N_2, 125 psig)	10 psig (0.7 barg)	10 psig (0.7 barg)	10 psig (0.7 barg)	HFX-7, HFX0-7: 10 psig (0.7 barg) HFX-9, HFX0-9: 15 psig (1.03 barg) HFX-11, HFX0-11: 20 psig (14 barg)
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/110°F (4°C/43°C)	40°F/122°F (4°C/50°C)	40°F/122°F (4°C/50°C)	40°F/122°F (4°C/50°C)
Recommended Inlet Air Temperature	77°F (25°C)	77°F (25°C)	77°F (25°C)	77°F (25°C)
Inlet/Outlet Port Sizes	1/4" NPT	1/4" NPT	1/4" NPT	1/2" NPT
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.	42.5 lbs. (19 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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