

Wine Industry

Market Application Publication



Background:

During the winemaking process it is critical that wine be protected from contact with oxygen. The presence of oxygen promotes the growth of yeast and bacteria, which can cause spoilage and alter final product quality. Nitrogen minimizes the levels of oxygen present, preserving flavors and significantly improving shelf life. It is an essential tool in helping to alleviate the issues caused by the presence oxygen, and has become the preferred technology because it is economical and inert. A nitrogen generator, which separates nitrogen and oxygen from a compressed air supply, can often be the most cost effective way to supply this nitrogen.



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.

Application:

There are numerous points in the production process where wine has the opportunity to come in contact with oxygen and cause product quality issues, including storage, transport and sparging. A nitrogen blanket, reducing the oxygen concentration to less than 0.5%, minimizes contact between oxygen and the wine surface during storage (both pre and post bottling). This will prevent the growth of bacteria and other microbes. Nitrogen can also be used to purge air from pipes and hoses prior to bottling and to ensure oxygen is not introduced during transport. Finally, sparging with nitrogen will remove any oxygen or CO₂ introduced during handling helping to preserve wine integrity. If nitrogen is not used during these processes, the wine is exposed to oxygen and the level of dissolved oxygen (DO) increases. Using an inert gas helps to ensure minimal DO pickup.



Case Study:

Saintsbury is a Pinot Noir and Chardonnay producer in Napa Valley that uses nitrogen to rack wines, sparge tanks, and assist in the bottling process. It is used throughout their process to ensure product quality. Nitrogen was originally supplied by a local gas company delivered in cylinders and dewars. Fluctuations in usage requirements would frequently cause the winery to run out of nitrogen. This created not only an inconvenience, but also an economic concern as production had to be suspended until more nitrogen could be delivered. Saintsbury selected Parker Hannifin to supply a gas generator that would provide a continuous nitrogen stream for each of their processes. Ease of operation, minimal maintenance requirements

and return on investment (ROI) were important factors in their decision. Parker Hannifin gas generators are designed for trouble free operation, 24 hrs/day, 365 days/year. Installation was simple, as compressed air was piped in and the generator was connected to their existing nitrogen piping. The annual maintenance requirements were straightforward and inexpensive. Overall, the cost savings were impressive, initially yielding in a 14 month payback and ultimately providing price stability for the future. Saintsbury has had no issues with spoilage or DO pickup, and solved their nitrogen delivery issues. They recommend a Parker Hannifin nitrogen generator for improved efficiencies, ease of use and its trouble free operation.



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 |
|------------|------|-------|-------|-------|---------|---------|---------|---------|---------|
| 99.99 | 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 ₂ , 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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