



**COMPLETE
METALWORKING
SOLUTIONS**

(800) 991-4225
www.ahbinc.com
ISO Certified
customerservice@ahbinc.com



Series P7 Nitrogen Assist Gas

LSN2.com

The Most Reliable, Bullet-Proof Nitrogen Generators in North America...PERIOD.

A big claim? Yes, but backed up and proved by more than 6 million hours of installed machine usage, with 99.9+% uptime, and further backstopped by Liberty Systems 24/7, customer-delighting field support...all made transparently real to you by our many "happy customer" references from tough-to-please general managers, engineers, maintenance techs, and business owners, and available to you in our proposals.

We like to make your inner bean-counter happy, with a laser focus on delivering you maximum cost savings versus purchased nitrogen gas to make your generator investment payback quickly to the bottom line, plus we fulfill on the inherent promise of N₂ generation, which is always available, never run out of gas convenience and a much safer work environment versus the cost, hassle, and contract headaches associated with buying nitrogen via traditional tank and cylinder suppliers

Your typical N₂ generator desktop engineer hasn't lived the life of the maintenance and support mechanic, we have and you benefit from this know how. To top off our machine reliability crusade, our founders insisted that their machines be built under rigid ISO 9001 quality standards, in place and certified since 2008.

Series P7

Our Series P nitrogen assist gas generators are based on pressure swing adsorption (PSA) technology. Series P nitrogen generators have the ability to produce higher purity nitrogen and greater flow rates than our Series M nitrogen assist gas generators. With typical delivery pressures of 22 barg (320 psig) up to 29 barg (420 psig) utilizing a nitrogen gas booster. Standard purities of 99.5% to 99.99% with the option of up to 99.995%.

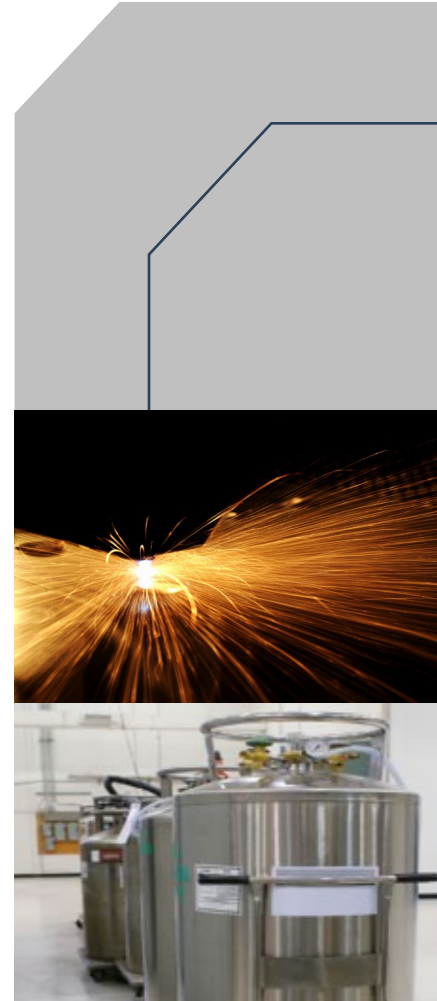
All series P7 nitrogen generators include an integral percent type oxygen analyzer and incorporate a 3-way ball valve at the outlet to allow a backup nitrogen source to be connected. With proper preventive maintenance, quality supply air and our proprietary media blend that is part of the pre-filtration system, series P7 nitrogen generators are expected to have a life of more than 10 years.

Standard 3 Year Warranty

Our after sales support group has had it pretty easy over the years. The systems are so strong and dependable we took our industry leading two year warranty and made it three years. Not good enough for you? Do you want a 5 year warranty? Simply ask and we will configure the system with a few additional features to get you there.

Experience

Liberty Systems unwavering dedication to results defines our products and offers an impressive portfolio of gas products. Our ISO 9001 management processes, quality control methods, and our dedication to the advancement of separation technology ensure that our clients' most complex projects are delivered on time. As a result, we enjoy enduring relationships with our existing clients, as well as a constant flow of new business.



Selection

Determining the proper size of a nitrogen generator is not as simple as it seems. The local compressed air guy certainly knows a lot (we hope) about compressed air systems. They may even be able to get a nitrogen generator manufacturer on a conference call to explain how the system works but it is unlikely they know anything about lasers, whether it be a fiber, CO2 or DDL, we have been living metal fab for more than 15 years. Ask your local nitrogen generator distributor what a resonator is or what nozzle size for a given material and you will probably get a blank stare. Are you are looking for a piece of equipment or a solution.

We ask the right questions to ensure you are getting what you want. We have working partnerships with most of the laser OEM's, their dealers and distributors for a reason. We design, build and produce the most reliable nitrogen generators...Period.

Cost Analysis

Every solution we provide comes with a cost analysis. We try to gather as much information as possible to show a true representation of the money saved when investing into a nitrogen generator from Liberty Systems. For us to be accurate we will typically request what you currently pay for liquid N2, cost of your power, hours of operation, what material types you process and how thick. We include in the analysis the anticipated preventative maintenance costs and power.

Below is a Liberty Systems customer cutting 1/4". Power cost is \$0.10 per kWh, operating 4000-6000 hours per year. The client was contractually held hostage by the gas company paying an absurd amount of \$1.25 per ccf for the micro-bulk supply of liquid nitrogen. \$100K or more savings annually, now that is ROI!

Analysis			
Monthly Liquid Nitrogen Expense (LN2)		Generated Nitrogen (GN2) Cost Analysis	
Current Cost per 100 cubic feet (ccf)	\$1.25	GN2 Nitrogen Cost per Hour	\$6.33
Rental Fees Per Bulk Tank	\$500.00	Monthly Cost	\$2,110.00
Rental Fees Per Trifecta	\$800.00	Annual Cost	\$25,320.00
Deliveries Per Month	\$4.00	Cost per Hundred Cubic feet	\$0.20
Delivery, Hazmat Fees	\$50.00		
Monthly Rental / Delivery and Han-	\$1,500.00		
Liquid Nitrogen Cost Analysis		Generated Nitrogen 7 Year Savings	
Liquid Nitrogen Cost per hour	\$44.50	GN2 Cost per Hour	\$6.33
Monthly Cost	\$14,833.33	LN2 Cost per Hour	\$44.50
Annual Cost	\$178,000.00	Annual Savings	\$152,680.00
Cost per Hundred Cubic Feet	\$1.25	Anticipated 7 Year Savings	\$1,068,760.00

Gas Contracts

Do you feel trapped locked into a 7 year product supply agreement with an evergreen clause and unlimited price increases?

With the explosion of fiber lasers in the past few years, we have been watching as gas consumption of those lasers increase. What does that mean? That means that you will most likely be paying more every month for nitrogen. Who is pleased about this? You guessed it, the industrial gas suppliers. They are in the business to make profits. Where do they get that profit from?

I certainly would not want to be locked into agreement like that, but what can you do? All the industrial gas suppliers have the same evergreen clause. It is like all the CEO's of the gas companies were at the country club one day after a round of golf, drinking bourbon and smoking \$100 cigars and the conversation went like this.

CEO #1: "hey, we should make the product supply agreements 7 years".

CEO #2: "yeah, and we should make it almost impossible to get out of it, how about an evergreen clause that renews the contract"?

CEO #3: "That is perfect, we also need to make sure we can give the customer unlimited price increases".

What if you could produce your own nitrogen gas, as much as you need 24 hours per day, 7 days per week? What if you had an in house Nitrogen generator? No more need for that 7 year industrial gas product supply agreement.

Series P7 Flow (scfh)					
	99.99%	99.95%	99.90%	99.50%	Dimensions (L x W x H)
P7-F3500	1501	2037	2359	3377	16' x 8' x 10'
P7-F4000	1742	2365	2738	3921	16' x 8' x 10'
P7-F5000	2284	3100	3589	5139	20' x 8' x 10'
P7-F6000	2610	3543	4102	5873	20' x 8' x 10'
P7-F7000	3002	4074	4717	6754	20' x 8' x 10'
P7-F8000	3485	4730	5476	7841	22' x 10' x 12'
P7-F9000	3916	5314	6153	8810	22' x 10' x 12'
P7-F10000	4503	6111	7076	10132	24' x 10' x 14'
P7-F11000	4744	6439	7456	10675	24' x 10' x 14'
P7-F12000	5227	7094	8214	11762	24' x 10' x 14'
P7-F13000	5658	7679	8891	12731	26' x 12' x 16'
P7-F14000	6004	8148	9435	13509	26' x 12' x 16'
P7-F15000	6553	8866	10265	14698	26' x 12' x 16'

***Larger Systems Available Upon Request**

Series P7 Air Compressor / Booster								
	99.99%		99.95%		99.90%		99.50%	
	Air Comp (kW)	N2 Booster (kW)	Air Comp (kW)	N2 Booster (kW)	Air Comp (kW)	N2 Booster (kW)	Air Comp (kW)	N2 Booster (kW)
P7-F3500	22	7.5	22	11	30	11	30	15
P7-F4000	30	7.5	30	11	30	11	37	15
P7-F5000	37	11	37	11	37	15	45	15
P7-F6000	37	11	37	15	45	15	57	22
P7-F7000	45	11	45	15	57	15	75	22
P7-F8000	57	15	57	15	57	15	75	22
P7-F9000	57	15	57	12	75	22	75	22
P7-F10000	75	15	75	22	75	22	93	30
P7-F11000	75	15	75	22	75	22	93	30
P7-F12000	75	15	75	22	93	22	112	30
P7-F13000	75	22	93	22	93	22	112	30
P7-F14000	93	22	93	22	93	22	112	45
P7-F15000	93	22	93	22	112	30	131	45

Nitrogen Generator Key Points

- Clear anodized aluminum extruded cylinders are used in place of large carbon steel vessels.
 - This prevents oxidation inside the vessel and allows us to employ the benefits below.
- Using a technique called snowstorm filling, each individual 6 inch tube is filled with CMS.
 - This allows for tighter packing of the CMS as opposed to large adsorber vessels that commonly employ a vibration or tapping method to settle the adsorbent.
- Snowstorm filling helps prevent “crowning” of the CMS.
 - Crowning of the CMS leads to fluidization which is the term used to describe the movement, breakdown or erosion of the CMS.
 - Fluidization is primarily due to the velocity of the compressed air entering large carbon steel vessels.
- Individual 6” tubes create a more efficient system and prevents the CMS from settling once the columns are depressurized.
 - By preventing settling of the CMS we are able to prevent the destructive process of fluidization.
- AMT (adsorption media tube) is a proprietary product made from zeolite, the same product used in a desiccant dryer but used in powder form. The zeolite powder is combined with a polymer and then extruded as a tubes. These tubes are inserted into each of the individual columns and provide the same drying advantages as a desiccant dryer (-40°C dew point) without the additional consumption of compressed air.
- Touch screen display for ease of use and display of system performance.
- Certified pressure relief valves
- Bilingual labels and safety decals
- Where flexible hoses or connections are used, hose chinchies / lanyards are provided
- All PSA modules are commissioned “in house” before being shipped; this prevents surprises” during start up or commissioning



Anodized Aluminum
Extrusions



Module Cut Away



Adsorption Media Tube

Kaeser Rotary Screw Compressors

Kaeser compressors have been designed from the ground up with the user in mind. Fewer wearing parts and premium materials ensure reduced maintenance requirements, longer service intervals and extended service life.

Each component from the inlet air filter to the discharge flange has been carefully selected with performance in mind. Kaeser compressors are up to 30% more efficient than the competition.

Kaeser employs more than 5500 people in over 100 nations and they continually add to the service and distribution network.

Kaeser Nitrogen Boosters

Kaeser utilizes premium efficiency TEFC motors on all their nitrogen boosters offering energy savings and long equipment life.

Automatic belt tightening systems and low rotation speeds promote that efficiency and extend operation life.



Kaeser Rotary Screw Air Compressor



Nitrogen Booster

Kaeser Service Technicians are Factory Certified

Kaeser is committed to providing the best after-sales service in the industry through our factory-trained, national distribution network. We have implemented the Kaeser Factory Certified Training (KFaCT) program to ensure the highest standards in local service.

KFaCT incorporates information on system basics, air system installation, maintenance, troubleshooting and clean air treatment.

Kaeser technicians' expertise is not limited to Kaeser equipment. Our training program was developed in conjunction with standards from the Department of Energy, the Compressed Air Challenge and the Compressed Air and Gas Institute. The program also includes non-Kaeser training materials to give technicians a quality, unbiased education. No matter what system is installed in your facility, your authorized Kaeser representative will be fully prepared to meet your service needs.

Kaeser is proud to sell equipment that is reliable and efficient, but even the highest quality equipment needs attention and maintenance to deliver the most reliable performance.

Kaeser offers preventive maintenance programs tailored to your needs :

- Major and minor service intervals
- Convenient, non-binding service agreements

24-Hour emergency repair

Service vans are stocked to handle nearly every repair—on the first trip!

With 24-hour parts shipment guarantee, an emergency breakdown doesn't have to mean a loss in production time.



For more information about opportunities regarding your application, please contact us or visit our website.

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