



## Nitrogen Assist Gas



## Assist Gas

### What We Do

We provide solutions and help business conserve money by supplementing or replacing their current nitrogen supply with the use of on location nitrogen generators.

### Nitrogen Assist Gas

Nitrogen is the choice of assist gas when a clean, oxide free edge is desired. An oxide free edge is frequently requested on stainless steel, aluminum or thin gauge carbon steel. Eliminating oxide, the part is able to be painted, powder coated or welded without any additional labor.

Nitrogen cutting uses a sublimation, or melting, technique. The process heats the metal without a chemical reaction, and the high pressure of the nitrogen gas pushes the resulting molten puddle through the kerf.

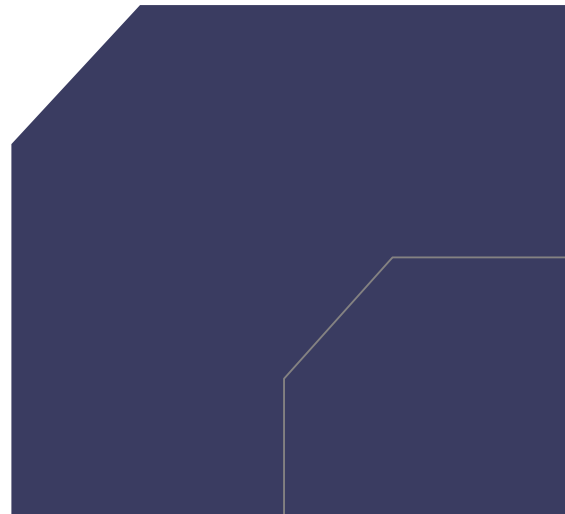
### Dry Air Assist

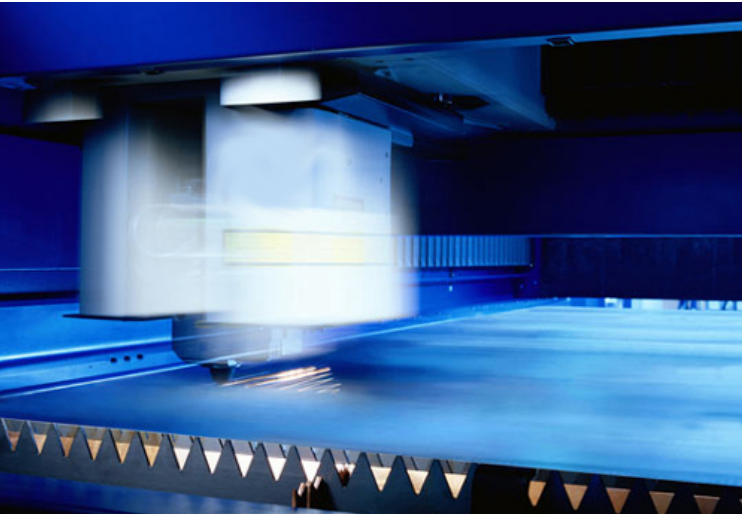
The process is not new, but the benefits of cutting parts with compressed air instead of nitrogen is a growing trend. During air cutting, the reaction produces plasma. This is similar to the way in which a CNC plasma cutting center uses electricity to create plasma.

Laser energy is brought to a tight focal position, and the introduction of compressed air creates a plasma ball at the surface of the material. Plasma transfers heat more effectively than the laser beam does by itself. Increasing the cutting speed often is necessary to prevent over melting the material edge.

### Selection

Selection of a suitable gas supply system requires knowledge of the maximum assist-gas pressure, the peak flow rate, and monthly volume of gas consumed, which can be determined by answering questions about the process. Laser-output power, material and thickness to be cut, percent of maximum thickness to be processed, numbers of hours of operation, duty cycle, and number of lasers, figure into the calculations.





## Solutions

We Offer two types of nitrogen assist gas generators. Our Series M nitrogen generators are based on air separation membrane technology and have a delivery pressure of 205 psig to the laser. Series M nitrogen generators are typically installed when stainless steel and aluminum material thickness is less than 3/16". The M series nitrogen generators are also a terrific solution for thin gauge carbon steel.

Our Series P nitrogen 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. With a delivery pressure as high as 425 psig, thicker materials are able to be processed.

### Air Separation Using Membrane

Gas separation with polymer membranes is a mainstream separation technology. The most widely practiced separations are enriched nitrogen production from air. Such purified nitrogen is widely used for applications that require nitrogen purities of 99.9% or less and flow rates below 5000 cubic feet per hour. Relative to pressure swing adsorption systems, membranes systems have a lower capital and operating cost. A small footprint makes them ideal for use in applications where space is valuable.

### Pressure Swing Adsorption Using Carbon Molecular Sieve

Pressure swing adsorption (PSA) is attractive, because it is capable of producing a very pure nitrogen product (99.999%) and higher flow rates than membrane based systems. PSA nitrogen generators are commonly used for applications that require nitrogen purity above 99.9% as in the electronics or pharmaceutical industry.

## Benefits

With nitrogen generation, your nitrogen expense typically goes down when compared to traditional sources of nitrogen. Nitrogen generation costs are fixed allowing you the ability to accurately bid work and compute your monthly or annual budget. There is no loss of nitrogen due to evaporation and no missed deliveries. Most of our assist gas generators qualify for 179 deductions and we provide you with a cost analysis calculation.



## Series M5

Liberty Systems Series M5 Nitrogen Generators offer reliable, cost effective, in plant generation of nitrogen with purities up to 99.5% and flow rates as high as 10,800\* scfh at 95%, delivering up to 205 psig for your application.

M5's are complete packages, The package includes a Kaeser Variable Frequency air compressor, our proprietary pre filtration system, a Kaeser sigma controller and a compressor condensate management system. An oxygen monitor is standard on the M5-2250 and M5-3000 and can be installed as an option on the M5-750 and M5-1500. Also available is an optional air dehydration membrane for air assist at flow rates of 1800 scfh and pressure dew points of -40°F.

## M5 Flows

M5 Nitrogen generators are membrane based and include a Kaeser variable speed rotary screw compressor

### Flow Shown Below are at 205 psig Delivery

Model	Flow @ 99.9%	Flow @ 99.5%	Flow @ 99.0%	Flow @ 97%	Flow @ 95%	Dimensions H x W x D (in)	Weight (lbs)	HP
M5-750	375	<b>750</b>	1048	1941	2750	76 x 84 x 42	2250	30
M5-1500	750	<b>1500</b>	2000	3800	5400	86 x 90 x 47	3180	50
M5-2250	1125	<b>2250</b>	3000	Custom	Custom	96 x 96 x 50	4300	60
M5-3000	1500	<b>3000</b>	4000	Custom	Custom	96 x 96 x 50	5620	100

Flows are listed in scfh, for NM3/H the multiplier is 0.0283  
Maximum operating ambient temperature is 140°F

**Semi annual maintenance is required on all models**

Annual Pre-Filter Maintenance Kit	Model
FMK21030	M5-750 and M5-1500
FMK21040	M5-2250 and M5-3000

## Series P7

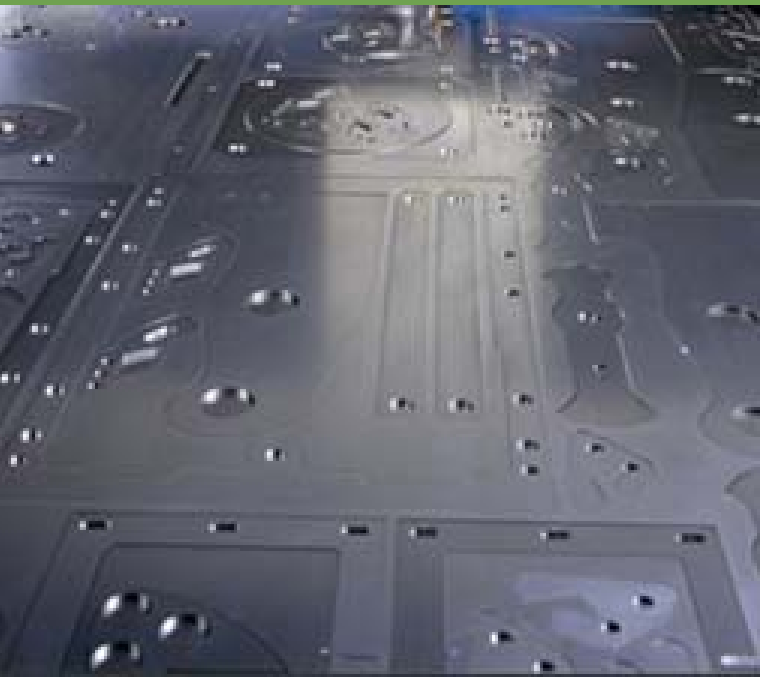
P7 Nitrogen generators are PSA based and are designed for purities above 90.0%. All P7's include a Kaeser variable speed rotary screw compressor, our proprietary pre filtration system and a heatless desiccant air dryer for additional protection of the carbon molecular sieve (CMS). A booster compressor is included to provide a typical nitrogen delivery pressure of 325 psig. All systems include an oxygen analyzer.

## P7 Flows

Flow Shown Below are at 325 psig Outlet							
Model	Flow @ 99.999%	Flow @ 99.95%	Flow @ 99.9%	Flow @ 99.5%	Dimensions H x W x D (in)	Weight (lbs)	HP
P7-2000	270	1120	1236	<b>2000</b>	104 x 96 x 120	2100	30
P7-3000	456	1720	1900	<b>3000</b>	104 x 96 x 120	2240	50
P7-4000	540	2240	2460	<b>4200</b>	104 x 120x 120	2300	60
P1-5000	720	2840	3140	<b>5000</b>	104 x 120 x 144	2680	75
P1-6000	900	3440	3800	<b>6000</b>	104 x 120 x 144	2875	100
Contact us for higher flow rates							
Flows are listed in scfh, for NM3/H the multiplier is 0.0283 Maximum operating ambient temperature is 140°F							
<b>Semi annual maintenance is required on all models</b>							
<b>Annual Pre-Filter Maintenance Kit</b>					<b>Model</b>		
FMKP7030					P7-2000 thru P7-3000		
FMKP7040					P7-4000 thru P7-5000		
FMKP7050					P7-6000		

## Series P9

Series P9 Nitrogen generators have delivery pressures up to 425 psig. Please contact Liberty Systems for flow rates, purities and dimensions.



## Beyond the Technology

### Just a Phone Call Away!

For more information about opportunities regarding your application, please contact us or visit our website [www.LibertyN2.com](http://www.LibertyN2.com).