



Laser Cutting Gas Solutions

LSN2.com

The Most Reliable, Bullet-Proof High-Performance Systems 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 nitrogen generator or high-performance air system investment payback quickly to the bottom line, plus we fulfill on the inherent promise of 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 desktop engineer hasn't lived the life of a 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.

Laser Cutting Gasses

Liberty Systems offers three options for laser cutting gasses, mixed gas, high-performance air and nitrogen. We will consult with you to determine which is the best option for you and your operation.

Series BRS

BRS stands for burr reduction solution. These are gas mixers that blend oxygen and nitrogen to help yield a burr or dross free edge on certain types of materials that would otherwise be cut with straight nitrogen.

Series D

Series D are dry air assist systems. These systems should not be confused with shop air cutting. Shop air cutting works for thinner gauge materials, but when you get to the upper ranges of the laser capacity the air should be dry, very dry. We supply these systems with the air compressor, our proprietary pre filtration system, dehydration unit and a booster compressor if high pressure is needed.

Series M

Series M are complete packages and air separation membrane based. They include the air compressor, compressed air tank, our proprietary pre filtration system and nitrogen generator. Liberty Systems took the original designs from the early 2000's, improved them and now have hundred's in the field operating failure free for more than ten years.

Series P

Series P are PSA (pressure swing adsorption) nitrogen generators. As with our series M, these are complete packages that include the compressed air or supply air, air filtration, the nitrogen generator, associated tanks and to get elevated pressures, a booster compressor. We will work with you to determine the purity level desired for your application, up to 99.999% for an oxide free edge.



Optional 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.

Silver, Gold, Platinum

Liberty offers three package tiers, Silver, Gold and Platinum. Each tier has its benefits. Want to keep it simple? Choose the Silver package. Interested in a variable frequency drive compressor? Request a quote for our Gold package. Want a system with some of the best service technicians in the world? Choose our Platinum package.

Platinum Package

Our Platinum packages come standard with fixed speed load / unload Kaeser rotary screw air compressors and gas boosters.

Kaeser Rotary Screw Air 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 have been carefully selected with performance in mind. Kaeser compressors are up to 30% more efficient than the competition.

Variable frequency drive air compressors are offered as an option.

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

Gold Package

Our Gold package is supplied with an Ozen variable frequency drive rotary screw air compressor and an oil injected load unload booster compressor. For systems greater than 6000 scfh (100 scfm), a market leading variable frequency drive rotary screw booster compressor is standard.

Ozen Rotary Screw Air Compressors

Ozen is a packager. They source the finest components for their air compressors and booster compressors. They are assembled in Konya, Turkey and the US corporate headquarters are located in Charlotte, NC.

Their variable frequency drive is manufactured by Danfoss, the airend is produced by Rotorcomp, the electrical contactors and starters are Siemens and the motors are manufactured by WEG.

Ozen Gas Boosters

Ozen produces the only rotary screw, direct coupled variable frequency drive gas boosters in the market. These boosters are standard offering on our Gold package with flow rates greater than 6000 scfh (100 scfm).

Ozen is one of the leading producers in Eastern Europe and the Middle East. It has sales and service activities in 20 countries, through 100 distributors. Exports made to 45 countries constitute 30% of all sales.

Silver Package

Our Silver packages come standard with fixed speed load / unload Hertz rotary screw air compressors and gas boosters.

Hertz Rotary Screw Air Compressors

Hertz Kompressoren was founded in Germany with aim of manufacturing air compressors with high level of German engineering. Hertz is a premium brand of Dalgakiran Group Company, one of the leading air compressor producers in the world.

Hertz rotary screw air compressors are standard with a IP55 electric motor and IE3 efficiency class. The air compressors are designed to be serviced easily.

Hertz Gas Boosters

Hertz gas boosters have a cast iron cylinder with an aluminum alloy cylinder head. Stainless steel is used for the high capacity suction and discharge valve.

Hertz Kompressoren is an international company with global presence engaged in designing, manufacturing and sales of air compressors and compressed air equipment.

Extended Warranty

Liberty Systems offers the best extended warranty in the industry. How can we do this, simple, build a package that is strong and dependable. It is in our best interest that the system we provide you is worry free and keeps producing. The last thing we want is our name, one of the most recognized in the industry, to get tarnished because the system your down.

Liberty Systems offers an optional "up to" three year warranty. For you to capitalize on this, all we ask is you perform the preventive maintenance as scheduled, document that the maintenance was performed and submit an oil sample to an independent lab for analysis. Why the oil sample, because, reading an analysis of your oil we can determine if condensation, metal fragments or possibly a high acid content is present. If there is a high acid content, which can damage the air compressor, we can find the source and eliminate it before something catastrophic happens.

For us, it is about being proactive, we have a team in our after sales support group that are in communication with your maintenance team so you can enjoy worry free operation of your equipment.

Below is a portion of the three year warranty agreement. The entire document is available upon request.

The Three Year Warranty program is contingent on the following provisions:

The optional "Three Year Warranty" program applies to Liberty Systems Series D5, D7, D9, M5, M7, M9, P5, P7, P9 and P11.

- Liberty Systems' normal warranty policies and procedures concerning warrantable failures, credits for labor, travel and mileage and freight charges apply to the warranty period and are as follows:
 - Stage one: **Parts and labor.** *Months one (1) through (24) twenty-four from date of startup or (30) thirty months from date of shipment.*
 - Stage two: **Parts only.** *Months (25) twenty-five through (36) thirty-six from date of startup or (42) forty-two months from date of shipment.*
 - Stage two labor, lodging, travel expenses and meals will be billed as a direct pass through to the customer during the extended warranty period.

To qualify for the "Three Year Warranty", a customer must purchase preventive maintenance items and perform preventive maintenance requirements. The customer must keep detailed records as to what and when preventive maintenance was performed.

To qualify for the "Three Year Warranty", a customer must purchase the first 4000 hours of preventive maintenance items from Liberty Systems at the time of system purchase.

- Should the customer exceed 4000 hours of operation within any twelve (12) month period, additional preventive maintenance items shall be required.

To extend the warranty into subsequent years, the customer shall continue to purchase preventive maintenance items as required through the term of the "Three Year Warranty" agreement.

To further qualify for the Liberty Systems "Three Year Warranty" program, the customer must submit an oil sample for analysis every 2000 hours during the term of the warranty period.

The Truth About Industrial Gas Contracts

So you are tired of the industrial gas company, I cannot tell you how many times I have heard this before. Every 6-12 months your salesperson comes to you with another price increase, they tell you “corporate” is making them do it.

Have you ever been on the receiving end of a phone call from your plant manager, informing you that you just ran out of nitrogen, and once again production is on hold?

Have you ever walked through your facility, and noticed the laser not producing, you ask the laser operator why? The operator tells you that the industrial gas supplier is refilling your nitrogen tank and you can't operate the laser when this takes place.

Have you ever watched the gas supplier refill your tank? They depressurize it! This is effectively venting your nitrogen and along with it, your money, poof, right into the atmosphere.

I sometimes think that the supplier sends their trucks to refill your tank more than they should, just so they can vent your tank and sell you more nitrogen.

And then there is the evergreen clause in the product supply contract, it seems, the only way out of the evergreen clause is if you send a cancellation letter exactly 6 months, 11 days, 32 minutes and 15 seconds before the end of the agreement, or you are recommitted for the initial term of the agreement. Now I am being facetious when I refer to the time line to cancel the product supply agreement, but I am not that far off. The product supply agreements all pretty much read like this:

TERM

Except as provided in Articles 3, 5 and 7 or the Rider(s), this Agreement will be in effect from the date hereof and will continue in effect thereafter as to each Rider for the period of the Basic Term, and will continue in effect thereafter as to such Rider until either party terminates such Rider effective upon the expiration of the Basic Term thereof by giving to the other party not less than twelve (12) months prior written notice of termination with respect to such Rider or, if either party does not so terminate such Rider upon the expiration of the Basic Term thereof, such Rider will continue in effect thereafter for successive renewal terms equal to the period of the Basic Term of such Rider (the “Renewal Terms”) until either party terminates such Rider effective upon the expiration of any Renewal Term by giving the other party not less than twelve (12) months prior written notice of termination with respect to such Rider.

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”.

Then they all start to laugh and agree on the next clause:

PRICE CHANGES

Seller will have the right to adjust the Prices by giving Buyer not less than fifteen (15) days prior written notice of the effective date of such adjustment; provided, however, that if said Prices are increased and Buyer, within fifteen (15) days after said notice, furnishes Seller with credible written evidence that Buyer can purchase Product to which such increased Prices apply from a responsible supplier for a specified term in like quantities at lower prices under similar terms and conditions, and Seller, within fifteen (15) days thereafter, does not agree to either meet said lower prices or rescind the notice of increased Prices, Buyer will have the right within ten (10) days thereafter to terminate this Agreement as to the supply of Product for which such lower prices are offered by giving Seller not less than ten (10) days prior written notice. If Buyer exercises such right of termination, the cost of removal of the Supply System used for the supply of such Product will be borne by Buyer. If Seller agrees to meet the lower prices or rescind the notice of increased Prices, Seller may extend the term of the Rider covering such Product for a period equal to the period of the Basic Term of such Rider. Any adjustments made by Seller pursuant to this Article 7 with respect to any Monthly Service Charge or Monthly Rental set forth in the Rider or to surcharges or other charges which arise pursuant to Article 3 will not be subject to the proviso contained in the first sentence of this Article 7.

Let's dissect a few parts of the “price changes” clause for a moment.

No limit as to the number of price increases

The increase is effective 15 days after the seller submits their increase

If a price increase is submitted by seller, you, the buyer have 15 days to get a quote from an alternative source with a lower cost, **not equal**, it must be lower

The new quote must be for product of like quantity **AND** similar terms and conditions.

If your current supplier meets the lower prices you **MUST** resign with them for the initial term of the contract.

Looking at only two of the clauses in the industrial gas supply agreement and to me they have you on the never ending merry go round.

High-Performance Dry Air Assist

With the introduction of fiber lasers came the rise of high-performance air cutting. The higher the wattage, the thicker materials you can cut.

To process the upper ranges of Stainless Steel and Aluminum, you will need a compressor capable outputting elevated pressures, in other words the 125 psig shop compressor just won't cut it (no pun intended). Pressure requirements are typically higher than the standard shop compressors and require a dedicated system for cutting. We couple our Series D units with a rotary screw air compressor and provide delivery pressures up to 14 barg (204 psig) for thinner gauge material and up to 30 barg (440 psig) for the thicker ranges when a booster compressor is included.

We offer flow rates of up to 200 scfm and extremely low pressure dew points using a proprietary blend of dehydration media.

Series D5

Liberty Systems D5 High-Performance Air Systems deliver up to 14 barg (204 psig) for thinner gauge material. We couple a high pressure rotary screw air compressor, our proprietary pre filtration system and a dehydration unit to deliver very dry air to your application. Flow rates typically top out at 75 scfm for our series D5.

Series D7

Our Series D High-Performance Air systems are based on creating extremely dry air. Series D7 High-Performance Air systems have the ability to produce higher pressures and greater flow rates than our Series D5 High-Performance Air Systems. With typical delivery pressures of 27 barg (400 psig) utilizing a gas booster.

With proper preventive maintenance, quality supply air and our proprietary media blend that is part of the pre-filtration and dehydration system, series D5 and D7 High-Performance Air Systems are expected to have a life of more than 10 years.

High-Performance Dry Air Assist

With the introduction of fiber lasers came the rise of high-performance air cutting. The higher the wattage, the thicker materials you can cut.

All of Liberty's D5 High-Performance Air Systems deliver up to 14 barg (204 psig) for thinner gauge material and up to 30 barg (440 psig) with the D7's for the thicker ranges when a booster compressor is included.

Series D5 / D7					
	Flow scfm (scfh)	Max Pressure barg (psig)	Air Comp kW (HP)	Booster kW (HP)	Dims (L x W x H)
D5-F30	30 (1800)	14 (204)	15 (20)	NA	10' x 4' x 5'
D5-F50	50 (3000)	14 (204)	22 (30)	NA	10' x 4' x 5'
D7-F25	25 (1500)	30 (440)	7.5 (10)	7.5 (10)	10' x 8' x 8'
D7-F50	50 (3000)	30 (440)	15 (20)	15 (20)	11' x 8' x 8'
D7-F75	75 (4500)	30 (440)	18 (25)	15 (20)	11' x 8' x 8'
D7-F100	100 (6000)	30 (440)	22 (30)	15 (20)	11' x 8' x 8'
D7-F125	125 (7250)	30 (440)	30 (40)	22 (30)	12' x 10' x 10'
D7-F150	150 (9000)	30 (440)	37 (50)	22 (30)	12' x 10' x 10'
D7-F200	200 (12000)	30 (440)	45 (60)	30 (40)	12' x 10' x 10'
*Larger Systems Available Upon Request					

Nitrogen Assist Gas

Nitrogen assist gas generation has been around for a long time, we helped develop nitrogen generation for assist gas and implement it for laser cutting with an old friend, Nitrogen Joe. Nitrogen assist gas generation has been getting a lot of attention lately. Increased costs of delivered nitrogen, higher rental and delivery fees. Depending on the finished edge color you prefer, the thickness or material type you process we have a solution. We have the ability to manipulate the purity of the gas being delivered to achieve what you want in a finished product.

Series M5

Series M5's are membrane based complete packages, designed to cut up to 3 mm (0.125") and thinner SS, Aluminum and MS. The package includes a fixed speed or variable frequency rotary screw air compressor, a compressed air tank, our proprietary pre filtration system and nitrogen generator. Purities up to 99.9% and flow rates as high as 10,000 scfh @ 95.0%, delivering up to 14 barg (204 psig) for your application.

Series P7

Our Series P nitrogen assist gas generators are based on PSA (pressure swing adsorption) technology. Series P nitrogen generators are designed to run 24/7, we call this on demand and 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 27 barg (400 psig) utilizing a nitrogen gas booster. Standard purities of 99.5% to 99.95% with the option of up to 99.999% for an oxide free edge.

Series P9

The Series P9 nitrogen assist gas generators have the same performance characteristics as the P7 series. The difference, outlet pressure is 35 barg (510 psig).

Series P11

The P11's, what can we say, they have their niche but in a high production metal fabrication environment, it is a small niche. We build these to the same exacting standards as the rest of our product line but limit the duty cycle. This is not because we think they will fail, we do this to save you money. Series P11's are storage systems, we essentially fill 3000 psig (207 barg) cylinders overnight, then the following day we use that stored gas, pressure regulated to 27 barg (400 psig) to supply the cutting gas to your laser.

The limiting factor that we insist upon, we prefer that the booster compressor only run overnight and be off or at rest during the day. The maintenance on these high pressure boosters is costly and if you want operate them as an on demand system running 24/7 then we would suggest a series P7.

Nitrogen Assist

All of Liberty's M5 nitrogen assist gas generators up to 14 barg (204 psig) for thinner gauge material and up to 30 barg (440 psig) for the thicker ranges with the P7's, P9's or P11's when a booster compressor is included.

Series M5 Flow (scfh)					
	99.9%	99.5%	97.0%	95.0%	Dimensions (L x W x H)
M5-F750	500	750	1554	2500	9' x 4' x 8'
M5-F1500	1000	1500	3108	5000	10' x 4' x 8'
M5-F2250	1500	2250	4660	7500	14' x 4' x 10'
M5-F3000	2000	3000	6214	10000	14' x 4' x 10'
*Larger Systems Available Upon Request					
Series P7 Flow (scfh)					
	99.99%	99.95%	99.90%	99.50%	Dimensions (L x W x H)
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 P11					
	Volume per Day (cuft)	Base N2 Storage	Air Comp (kW)	N2 Booster (kW)	Dimensions (L x W x H)
P11-V1100	26400	10000	15	11	13' x 8' x 8'
P11-V1500	36000	15000	18	11	13' x 8' x 8'
P11-V2200	52000	22000	30	15	13' x 8' x 8'
P11-V3000	72000	30000	30	22	15' x 10' x 10'
P11-V4000	96000	30000	37	30	15' x 10' x 10'
P11-V5000	120000	30000	55	30	18' x 12' x 12'
*Larger Systems Available Upon Request					

Burr Reduction Solution (BRS)

Are you looking for a way to reduce and potentially eliminate the burr when processing aluminum? Are you looking to increase speed on mild steel? Coupling the Burr Reduction Solution from Liberty Systems with your fiber laser can help.

Liberty Systems helped develop mixed gas cutting with the help of a good friend, let's call him Jeff. Jeff kept getting burr free aluminum cuts on a CO2 laser utilizing a Liberty Systems Series M5 nitrogen assist gas generator. Jeff could not explain it, so he called us in. After watching the process for a few hours, a couple of quick calculations and voila, we determined that the flow rate and pressure being used to cut the aluminum was causing the generator to produce a certain purity. We then reproduced it using a gas mixer. Although the process took off slowly, the boom of fiber lasers in the early 2010's put mixed gas cutting at the forefront and we have not looked back.

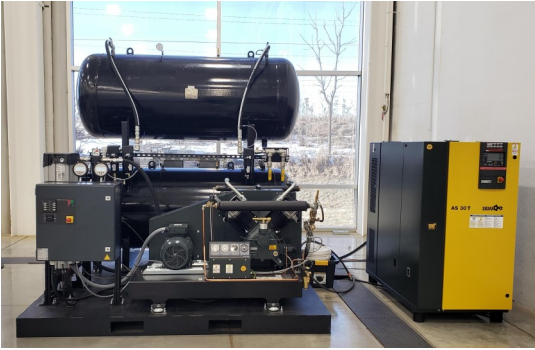
Benefits

- Improve productivity of the laser and improve overall part quality
- Eliminate 95% to 100% of the burr on aluminum and thicker mild steel. Have you ever tried to remove the burr form aluminum cut with straight nitrogen?
- Eliminate secondary process on aluminum and mild steel
- Reduced cutting pressure means less flow

All of our Series BRS come with dome loaded regulators to set the correct inlet pressures into the mixer. We include an oxygen analyzer so you know the mix purity is correct. We include an endline filter that has been cleaned for laser use and a twenty-five foot hose to make the connection between the mixer and the laser.

BRS5000					
Inlet Pressure (psig)	400	375	350	300	250
Flow (scfh)	5000	4500	4000	3500	3000
BRSV5000					
Inlet Pressure (psig)	400	375	350	300	250
Flow (scfh)	5000	4000	3500	3000	2500

Technical Data	
Gas Types	O ₂ / N ₂ (pilot / control gas)
Installation	Indoor Only
Ambient Temperature	-4°F to +104°F (-20°C to +40°C)
Max Altitude	2000 m above sea level
Minimum Gas Inlet Pressure	200 psig Dynamic (27.6 barg)
Maximum Gas Inlet Pressure	450 psig Static (40 barg)
Pilot Pressure (control gas)	10-20 psig Less Than Inlet Pressure (+/- 1 barg)
Maximum Gas Inlet Pressure Difference (Δp)	43.5 psig (3.0 barg)
Analyzer Type	Zirconia Percent (0-25%)
N ₂ Inlet Connection	1/2" FNPT
O ₂ Inlet connection	1/2" FNPT
Outlet Connection	1/2-1.0" FNPT
BRS5000 Dimensions / Weight	72"H x 30"D x 30"W / 825 lbs
BRSV Dimensions / Weight	40"H x 11"D x 20"W / 65 lbs
Power	115 Vac / 60 Hz / 96.6 VA (0.882 A)



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

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