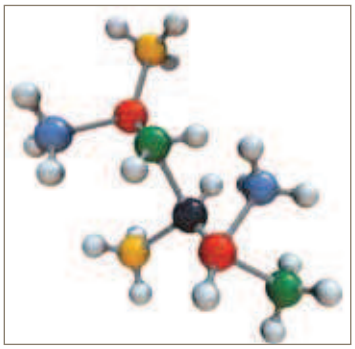

Analytical Gas Systems

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Parker domnick hunter

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Parker domnick hunter
Technology you can trust

Parker domnick hunter is the leading provider of Gas Systems for the Analytical Instrument market. Generators are specifically designed to meet the stringent gas requirements for all the leading Analytical Instrument manufacturers including Agilent, Thermo Fisher, Waters, Shimadzu, AB Sciex, Perkin Elmer and many others.

Utilising Parker's range of patented proprietary technologies, there are 1,000's of systems installed worldwide. These technologies offer some unique performance benefits, including guaranteed ultra high purity gas, silent operation, minimal moving parts and minimal operator attention. It is **technology you can trust.**

Improved instrument performance
Consistent gas quality and pressure improves stability and ensures greater reproducibility of results.

Convenience
No changing of gas cylinders or liquid dewars. On-demand supply 24/7 - generate gas as and when required.

Safety
Eliminate high pressure gas cylinders and liquid dewars from your laboratory.

Eliminates manual handling, reducing Health and Safety risks.

Cost
Payback in less than 18 months. Minimal ongoing maintenance costs.
No more gas costs, delivery and rental charges.

The End for High-Pressure Gas Cylinders?

High-pressure gas cylinders are a common sight in many laboratories: a default for supplying analytical instruments with their gas requirements, high-pressure gas cylinders are familiar and provide the gas that's required, so it could be said that the old adage, 'if it isn't broke, don't fix it', could well apply.

Despite this, increasing numbers of analytical instrument users are choosing to supply their GC FID, LC/MS and other types of instrument with gas via an analytical gas generator. Driving this decision will be a combination of factors broadly grouped into four areas; safety, cost, convenience and purity.

Safety Concerns...
High-pressure gas cylinders can provoke safety concerns in a number of different ways, some with potentially fatal consequences. The presence of high-pressure gas cylinders in the laboratory has been likened to sharing the laboratory with a potential missile. This stems from the behaviour of a cylinder that suddenly de-pressurises. There is enough force released with a European 'L' size cylinder to accelerate the cylinder to something like 66mph or 108km/h in around 1/10 seconds. Cylinders weigh in at 200lb (98kg), so there'll be enough momentum to cause some severe damage.

It's because of this potential 'missile scenario' that cylinders tend to be strapped down to something fixed. Even restrained, should a large cylinder suddenly vent its contents into the laboratory, then there are potentially fatal consequences. For example, if a high-pressure cylinder of nitrogen suddenly vented into the atmosphere of a laboratory, then more than 9,000 litres of un-breathable gas would be released. This would dramatically reduce the oxygen content of the air – presenting the possibility of asphyxiation. The risk of oxygen displacement from the atmosphere is also associated with liquefied gases whose volume will increase as much as 1,000 fold when in the gas phase. This means liquid nitrogen dewars can also be hazardous.

If the gas suddenly venting was a potentially explosive gas, as in the case of hydrogen, the result could be much more dramatic. Hydrogen will form an explosive mixture at just 4% volume in air.

These possibilities are the life threatening safety concerns associated with high-pressure gas cylinders. However, there is still the potential for other non-fatal injuries. The practice of rolling cylinders on their bottom edge comes with the risk of trapping toes or feet. With the 'smaller' cylinders there is also potential for heavy lifting injuries when being placed on a bench top.

Costs Increase Whilst Convenience and Purity are Reduced...
With high pressure cylinders the storage requirements are dictated by safety concerns, such as separating hydrogen cylinders and cylinders of oxidising gases. These often result in cylinders being some distance from where the gas is used and hence long gas lines. Whilst the longer gas lines result from the positioning of cylinders for safety concerns, the impact will be in the areas of cost, convenience and purity.

With any gas line there is the potential for leaks, and the longer the line the greater the potential. Hence the requirement to regularly leak-check the gas supply line – this both increases costs and decreases convenience - whilst leaks allow gas to escape and also allow impurities to enter the gas supply, which reduces purity and influences the accuracy of any analysis.

A Smarter Choice...
Analytical gas generators can remove the requirement for high-pressure cylinder gases for many analytical instrument users. Analytical gas generators are typically placed next to the instrument they're servicing. This removes any need for extended gas lines and with them associated problems impacting on purity, cost and convenience.

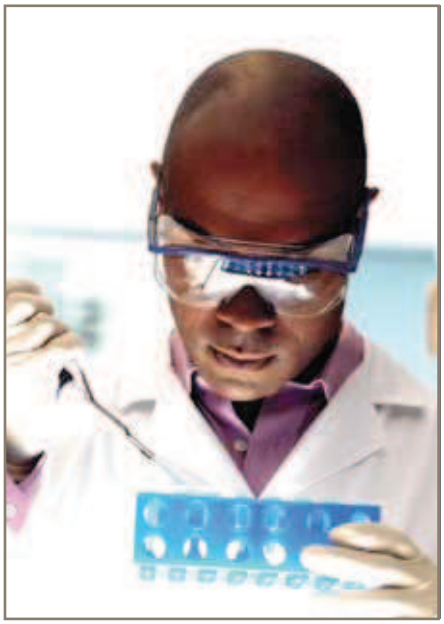
There are inherent features both in the design and the way in which generators operate which offer clear compelling reasons to switch from high-pressure gas cylinders. The latest gas generators utilise new technologies including adsorbents, catalysts, and specialist micro dryers, to produce ultra high purity gases. Generators are designed to be used at the point of use, simplifying and minimising the amount of pipe work, and guaranteeing ultra high purity gas reaching the instrument.

The generators are designed to run continuously with minimal annual maintenance and therefore minimal disruption to the gas supply. This all but eliminates the introduction of impurities, which can be reduced further by the installation of in line purifiers.

Increased Safety...
High-pressure gas cylinders will contain gas which is at a pressure of 200 to 300 times atmospheric pressure, and gas which is released to atmospheric pressure would have a volume in the region of 9,000 litres. Analytical gas generators operate at a fraction of this pressure and have very low volumes of stored gas within them. One of Parker domnick hunter's market leading hydrogen generators, for example, will have just 50 ml of stored gas, which will be at a maximum of around 5 times atmospheric pressure. Hence the missile concern is removed with a generator, and there's no large volume of gas to suddenly vent and make the atmosphere potentially explosive or deficient of life-supporting oxygen. Additional safety features are also incorporated in the design; for example, in Parker domnick hunter hydrogen generators there are leak detection auto shut-off devices.

Increased Convenience...
High-pressure gas cylinders will require regular replacement. Gas cylinders running out part way through analysis will result in unplanned downtime, and a replacement cylinder has to be collected and the old one removed which brings manual handling and safety concerns. After the new cylinder has been connected restarting the instrument, and waiting for stable baseline and

(continued)



re-calibration, are required before samples can be run. Life is more convenient with a gas generator as there's no unplanned downtime. Analytical gas generators only require simple quick maintenance which can be planned for – they don't unexpectedly run-out of gas halfway through analysis.

Increased Purity...
Analytical gas generators provide a constant source of gas. This removes the variations in purity between cylinders, helping to improve sensitive analyses. Purity is also preserved because there is no chance for impurities to enter the gas pipes, which may happen as cylinders are switched and regulators changed-over.

Reduced Cost...
High-pressure gas cylinders can also prove to be costly: typical payback periods for analytical gas generators are short – sometimes less than one year. The cost of using high pressure cylinders is not just the cost of the gas itself but other charges, some of which can be seen and others which are hidden. Cylinder rental and delivery charges are readily apparent, however there's also hidden costs. These must also be included to reveal the true cost.

Unlike cylinders, Analytical Gas Systems have no hidden costs. There are no recurring costs with generators for activities such as ordering replacement cylinders, there are no storage costs for the spare and empty cylinders, and there is no cost of lost productivity through the need to stop and replace cylinders.

Innovative Technology...
Parker domnick hunter analytical gas generators are world renowned for their reliability, dependability and long life. Since commercializing their first laboratory scale analytical gas generator in the 1980s, Parker domnick hunter now serve an installed customer base of over 40,000 gas generator users globally.

Part of the reason behind this is the unique innovative technology employed in Parker domnick hunter generators, from carbon molecular sieve, to the use of robust hydrogen membranes.

A Smarter Choice for LC/MS...
Providing nitrogen for uses such as LC/MS, Parker domnick hunter's pressure swing adsorption nitrogen generators represent state-of-the-art technology. The carbon molecular bed simply and efficiently separates compressed air into nitrogen. The carbon molecular bed achieves this due to its selective adsorption capabilities for different gases – oxygen and other unwanted constituents of the compressed air are simply removed by desorption – the complete process is monitored by a sophisticated control system.

These generators, when connected to an existing compressed air supply, will provide a constant supply of nitrogen with limited moving parts inside the generator. This means that the generator is very quiet whilst operating and there are minimal replacement parts.

A Smarter Choice for GC...
Hydrogen offers advantages for GC users when used as a carrier gas. The Van Deemter curves illustrate the wide range over which high efficiency is obtained, making hydrogen the best carrier gas for samples containing compounds which elute over a wide temperature range. The risks associated with high-pressure gas cylinders have already been outlined – hence a gas generator is the smarter choice for hydrogen. The optimised design of Parker domnick hunter hydrogen generators take deionised water and, through electrolysis, separate the hydrogen. This is then purified using desiccants, and specialist micro dryers.

An End For Cylinders?
With the improvements that gas generators offer in the areas of safety, purity, convenience and cost there's little reason to use high-pressure gas cylinders with instruments such as GC and LC/ MS. The range of Parker domnick hunter analytical gas generators also extends its technologically innovative approach to other techniques such as FT-IR, TOC, ICP, ELSD and Atomic Absorption.

Zero Air Generators

for GC combustion detector applications

The Parker domnick hunter UHP-ZA zero air generators produce a continuous stream of organic impurity free air from an external dry compressed air source and offer superior limits of detection over and above other modes of supply. Flow rates range from 1 L/min to 30 L/min.

The UHP-ZA generators feature an interchangeable top panel facilitating the direct mounting of any Parker domnick hunter hydrogen generator. The stackable system forms an innovative, modular FID gas station suitable for all known GC combustion detectors such as FID, FPD and NPD.

UHP-ZA generators may also be used in many other chemical analysis and life science applications, including LC/MS source gas, zero and combustion gas for total hydrocarbon analysers and as a gas sensing calibration and dilution gas.

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www.parker.com/dhfns

Product Features:

- **Ultra high purity, organic free, air for GC combustion detectors**
- **Increase resolution and detection limits of analysis**
- **Compact, reliable with minimal operator attention and maintenance**
- **Eliminate inconvenient and potentially dangerous air cylinders**
- **Payback period typically less than 24 months**
- **Models available to supply up to 75 FID's**

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Product Selection

Model	Flow Rate	Organic Impurity	Air Inlet @ 4 -10 bar g (58-145 psi g)	Delivery Pressure		Integral Compressor
	L/min	ppm	L/min	bar g	psi g	
UHP-10ZA-S	1	<0.1	1.2	4-10	58-145	NO
UHP-35ZA-S	3.5	<0.1	4.2	4-10	58-145	NO
UHP-50ZA-S	5.0	<0.1	6.0	4-10	58-145	NO
UHP-75ZA-S	7.5	<0.1	9.0	4-10	58-145	NO
UHP-150ZA-S	15	<0.1	18	4-10	58-145	NO
UHP-200ZA-S	20	<0.1	24	4-10	58-145	NO
UHP-300ZA-S	30	<0.1	35	4-10	58-145	NO

Note: Add suffix 'E' for 207-253V 50/60Hz ie. UHP-10ZA-S-E
Add suffix 'W' for 103 -126V 60Hz ie. UHP-10ZA-S-W

Technical Data

Ambient Temperature Range	5 - 40°C 41 - 104°F
Inlet Air Quality	Clean dry compressed air ISO8573-1:2001 Class 3.2.1
Supply Voltage Range	103 - 126V 60Hz 207 - 253V 50/60Hz
Port Connections Outlet (UHP-10ZA-S & UHP-35ZA-S) Inlet (UHP-10ZA-S & UHP-35ZA-S) Outlet (UHP-50ZA-S - UHP-300ZA-S) Inlet (UHP-50ZA-S - UHP-300ZA-S)	 1/8" Compression Fitting 1/8" Compression Fitting 1/4" Compression Fitting 1/4" Compression Fitting

Weights and Dimensions

Model	Height (H)		Width (W)		Depth (D)		Weight	
	mm	in	mm	in	mm	in	kg	lb
UHP-10ZA-S	325	12.8	340	13.4	425	16.7	10.2	22.5
UHP-35ZA-S	455	17.9	340	13.4	425	16.7	14.2	31.3
UHP-50ZA-S	455	17.9	340	13.4	425	16.7	14.2	31.3
UHP-75ZA-S	455	17.9	340	13.4	425	16.7	14.2	31.3
UHP-150ZA-S	455	17.9	340	13.4	425	16.7	15.2	33.5
UHP-200ZA-S	455	17.9	340	13.4	425	16.7	15.2	33.5
UHP-300ZA-S	455	17.9	340	13.4	425	16.7	15.2	33.5

Preventative Maintenance

Preventative Maintenance Kit	Part Number	Change Frequency
Inlet Filter PM Kit - all models	005A0	12 Months
Outlet Filter PM Kit - all models	005AA	12 Months
Fan PM Kit, 230V - all models	606272525	24 Months
Fan PM Kit, 120V - all models	606272526	24 Months

Catalogue: 174004753_00_EN 03/11

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