

Generating Gas Solutions

THE NEWSLETTER PROVIDING THE LATEST NEWS FROM ON SITE GENERATING SOLUTIONS

INDUSTRIAL APPLICATIONS

PACKAGING USING NITROGEN PURGE WITH ON SITE NITROGEN GENERATION

Shelf life of packaged food products, especially fresh produce and convenience foods can be extended dramatically by eliminating oxygen from the packaging. A proven solution is to process and pack under a nitrogen rich atmosphere as its low solubility and neutral pH makes nitrogen an ideal blanket and purge gas – controlling the atmosphere and extending the shelf life.

Most modern packaging machines have nitrogen purging as a standard feature or can easily be adapted to ensure that you have control over your packaging environment and can eliminate most oxygen.

Generators can be designed to suit single or

multiple machines and engineered to suit individual user's pattern of gas usage.

Nitrogen Generation Plants offer an independent, reliable and economic source of manufacturing your own nitrogen. This is an attractive alternative to other sources of nitrogen supply and fully automatic control of every nitrogen plant can eliminate the need for any intervention by personnel.

Regardless of whether you require a few m³/hour or several thousand; a standard model or tailor-made plant, a nitrogen generation plant will deliver the gas consistently as it is required to suit manufacturing and packaging applications.



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TECHNICAL INFORMATION FOR LABORATORIES

GAS CHROMATOGRAPHY TROUBLE SHOOTING GUIDES

A series of Trouble Shooting Guides for Chromatographers and GC users are now available free from On Site Generating Solutions (OSGS). The trouble shooting guides are specific to a situation, eg... *baseline off scale, unable to obtain a stable "zero"*.

The OSGS Trouble Shooting Guides for Gas Chromatography have been written as a practical tool for the end user and look at each situation separately, then identify each possible cause and provide a remedy for each. Regardless of individual's level of GC experience and skill, these Trouble Shooting

Guides are an excellent checklist of possible causes and remedies. Each "situation" has been written with the chromatographer in mind and provides remedies in an easy to follow format.

Register now to receive the 'Gas Chromatography Trouble Shooting Guides' and technical application articles by emailing info@onsitegenerating.com.

There are over 20 situations listed as well as a variety of individual technical application articles covering carrier gas selections and optimisation.

To request a copy of the GC Technical Articles or GC Trouble Shooting Guides call 5367 8277 or email info@onsitegenerating.com with details of the article or guide you are seeking.

GC TECHNICAL ARTICLES

Several technical articles have been commissioned by On Site Generating Solutions and are available on request to customers within Australia.

Currently there are five technical articles available, and these are titled:

1. Carrier Gas Selection In The Determination Of Pesticide Residues By High Resolution Gas Chromatography

2. Carrier Gas Selection And Its Effect On Optimisation Of The Flame Ionisation Detection
3. Choice Of Carrier Gas And The Operation Of The Thermal Conductivity Detector
4. Hydrogen... Help or Hazard. A Sensible Approach To The Use Of Hydrogen In Modern Gas Chromatography
5. Considerations in the Selection of Carrier Gas in GC/MS Applications

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LIST OF GC TROUBLE SHOOTING GUIDES

A series of trouble shooting guides specifically for GC applications are available. The title of the GC trouble shooting guides follows:

1. No Peaks Are Observed After Injection Of Sample
2. The Chromatogram Reveals A Solvent Peak Only, Or There Is A Missing Peak Of Interest
3. Retention Times Are All As Expected, But The Signal Response Is Uniformly Low
4. Retention Times Are Longer Than Expected, and The Signal Response Is Uniformly Low
5. Quantitation Is Not Reproducible....
6. Unable To "Zero" The System Due To Baseline Being Off-Scale
7. Baseline Drifting
8. Spurious Peaks , Either Ghost Peaks Or Additional Peaks
9. Irregular Or Unstable Baseline – Spiking
10. Repetitive Cycling Baseline
11. Negative Peaks, - As Opposed To Negative Baseline Shifts
12. Peaks Are Distorted, ie Are Not Symmetrical, (a) Leading Peaks (b) Tailing Peaks (c) Split Peaks.
13. Peak Are Not Skewed But Are Not Gaussian Either: (a) Peak Tops Are Flat (b) Peak Tops Are Rounded (c) Peaks Are Clipped At The Baseline
14. Baseline Stepping, Particularly After Large Eluting Peaks
15. Loss Of Signal After Injection
16. Negative Baseline Dipping After Injection Or Following Sample Peaks
17. Broad Solvent Peaks
18. Column Is Behaving Normally When Suddenly The Retention Times Become Prolonged Or Suddenly Shortened
19. Replace Column Of Nominally Similar Characteristics, Shows Different Behaviour To The Original Column
20. The Resolution Of An Apparently Normal Column, Suddenly Collapses
21. A New Column Rapidly Deteriorates After Installation

INDUSTRIAL APPLICATIONS

MOULDING, FURNACE & LASER APPLICATIONS

High Pressure + High Flow + High Purity
Nitrogen Generators support many manufacturing applications

We have expanded our range of products and services to include the design, supply, installation and service of high pressure nitrogen generators.

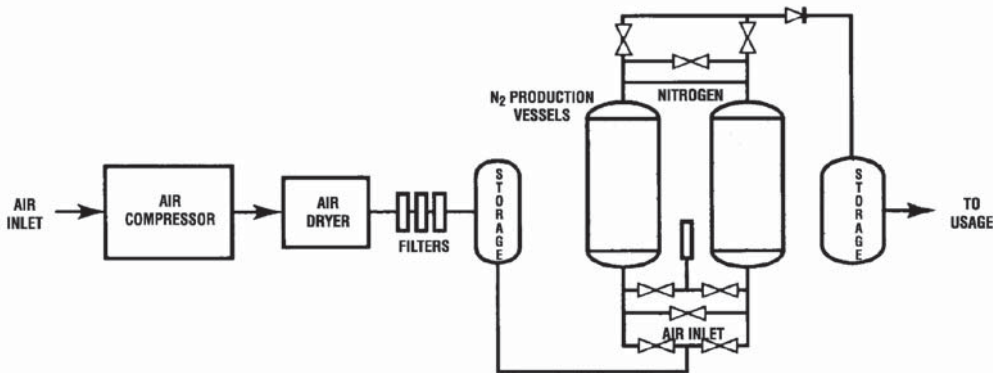
These nitrogen generators feature:

- Outlet pressures up to 350 Bar (5000 psi)
- Flow rates from a few m³ per hour to thousands of m³ per hour
- Purity level of Nitrogen up to 99.99%
- Nitrogen produced by Pressure Swing Adsorption (PSA) from inlet air supply of 5 to 7 bar
- Central PLC automatic control

The higher outlet pressures from the nitrogen generators are of particular interest for gas assisted moulding, furnace applications and

laser equipment. Generators can be designed to suit single or multiple machines and engineered to suit individual user's pattern of gas usage.

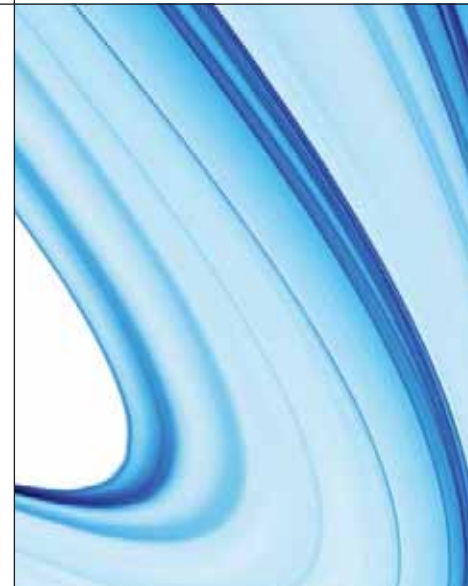
The process, based on the PSA-technology (pressure swing adsorption), makes use of the most common of all elements, Nitrogen. The PSA process is where ambient air is compressed in a lubricated, air cooled compressor. In a following step, this compressed air enters a refrigerated dryer and filters for removal of water and oil. Compressed air then flows through the carbon molecular sieve inside the adsorber beds where Oxygen is adsorbed while Nitrogen leaves the adsorber bed. During adsorption in one side of the bed, the second side of the bed is regenerated by depressurisation to ambient pressure. The adsorption/desorption cycle is controlled by a fixed sequence of a PLC-controller.



A range of options are available and these include: complete nitrogen generating plants, dedicated air compressors, additional high pressure N₂ storage reservoirs, modular system to allow retrofitting to meet increased requirements, oxygen analysers and more.

Previously these high pressures have not been achievable by gas generators as a cost effective alternative to cylinder or liquid nitrogen tanks. However, On Site Generating Solutions is now able to provide a cost effective, reliable, consistent and pure nitrogen supply at high pressures ... on-site.

Typical Nitrogen Generator – supplied skid mounted



PRODUCTS - INDUSTRIAL

STANDARD RANGE OF NITROGEN GENERATION PLANTS FROM CARBOTRADE

Supply of both Pressure Swing Adsorption (PSA) and High Flow Membrane (HFM) generators are available to meet the following specifications:

Area classification:	ATEX Zone 1 – Zone 2
Pressure Vessels:	ASME or CE code
Piping:	Stainless steel 316L or carbon steel painted
Valves, flanges & fittings:	Stainless steel 316L
Painting:	Standard polyurethane, option Marine/Off Shore per AFNOR specifications
Control Box:	SS 304, NEMA 4X/IP55
Control:	Standard with a PLC option touch screen for remote control Pressure vessel calculation following ASME V111 div.1 or CODAP, 97-23 CE
Purity:	95% to 99.999%
Dew point:	-50°C to -70°C
Standard delivery pressure:	5 – 7 bar with 10 bar compressor or with booster up to 330 bar up to 101 Nm ³ /hr at 99.999% or 919.1 Nm ³ /hr at 98% nitrogen purity. Larger flow rates are available as custom designed plants.
Flow rates:	

THE MICRO RANGE FROM CARBOTRADE

The Micro range of Pressure Swing Adsorption (PSA) generators can be supplied as follows:

System:

- Supplied on skid without air compressor, dryer, oil separator or storage tanks
- Custom designed nitrogen generation plants are available and will be tailored to meet individual specifications

Options:

- Supplied as a complete plant with air compressor, dryer, oil separator and storage and buffer tanks
- Oxygen Analyser with 2 gauges and 2 safety settings (purity and air pressure) installed on the PSA control box
- Optional delivery pressure up to 350 bar g systems available

Model	Flow	Nitrogen Purity %							
		Nm ³ /hr	99.999	99.995	99.99	99.95	99.9	99.5	99
Micros 550 SD	Prod. N ₂	0.12	0.20	0.28	0.37	0.50	0.71	0.90	1.15
	Air 10 bar	0.75	1.25	1.54	1.91	2.00	2.35	2.59	2.95
Micros 1000 SD	Prod. N ₂	0.20	0.34	0.46	0.68	0.91	1.25	1.53	2.00
	Air 10 bar	1.30	2.24	2.75	3.83	3.30	4.72	5.00	5.92
Micros 2500 SD	Prod. N ₂	0.54	0.85	1.20	1.70	2.16	3.30	3.90	5.00
	Air 10 bar	3.30	5.00	6.60	9.06	9.49	10.00	12.00	13.0
Micros 4000 SD	Prod. N ₂	0.85	1.40	1.92	2.72	3.45	5.25	6.28	8.00
	Air 10 bar	5.50	8.00	11.00	13.5	14.8	17.4	19.1	21.8
Micros 5000 SD	Prod. N ₂	1.06	1.70	2.30	3.24	4.25	6.40	7.65	10.0
	4 columns	Air 10 bar	7.0	10.6	13.0	18.1	19.0	22.4	24.6
Micros 8000 SD	Prod. N ₂	1.65	2.65	3.65	5.15	6.65	10.0	12.0	15.5
	4 columns	Air 10 bar	11.0	16.5	20.0	23.5	26.0	32.0	38.2

- The performance data is related to temperature of 20°C, pressure at 1013 mbar, relative humidity of 70%



CarboTrade Micro PSA Nitrogen Generator

COMPANY NEWS

GENERATORS ON SHOW FROM SEPTEMBER TO OCTOBER 2010

September through to October will be the time to see the newest range of gas generators from Peak Scientific Instruments. There are three exhibitions that On Site Generating Solutions and Peak Scientific Instruments will jointly attend a shared stand.

We will be at the following exhibitions:

20th International Symposium on the Forensic Sciences (ANZFSS)

5 – 9 September 2010
Sydney Convention & Exhibition Centre
Darling Harbour
www.anzfs2010.com

 VISIT US AT STAND No.46

HUPO - Human Proteome Organisation

19 -23 September 2010
Sydney Convention & Exhibition Centre
Darling Harbour
www.hupo2010.com

 VISIT US AT STAND No.11

2nd Australasian Symposium on Metabolomics

3 – 5 October 2010
The Sebel
Albert Park, Melbourne
www.australasianmetabolomics.org

 VISIT US AT STAND No.1

The following products will be on display at these exhibitions:

Membrane Nitrogen Generator - NM Range

Model NM32LA

- Applications LC/MS, LC/MS/MS
- Nitrogen - 32L/min @ 100 psi
- <0.01µm particles
- No suspended particles
- No phthalates
- Internal air compressor
- Noise level - 54 dB(A) @ 1 m

Manufactured by Peak Scientific Instruments

Gas Station for AB SCIEX LC/MS Instruments

Model ABN 2ZA

- System set to meet the flow, pressure and purity requirements of the AB SCIEX range
- Curtain Gas (Nitrogen) - 12L/min @ 80psi
- Source Gas (Dry Air) - 24L/min @110psi
- Exhaust Gas (Dry Air) - 8L/min @60psi
- <0.01µm particles
- No suspended particles
- No phthalates
- Noise level - 54 dB(A) @ 1m

Manufactured by Peak Scientific Instruments

TOC Generator

Model SC-TOC-A

- Designed to provide gas for both NPOC and TC-IC applications
- 300 cc/min @ 80psi
- -70°C pressure dewpoint
- <0.01µm particles
- <0.1 ppm Hydrocarbon concentration (as Methane)
- <1.0 ppm CO₂ concentration
- <1.0 ppm, CO Concentration
- <1.00 ppm SOX Concentration
- Noise Level - 57 dB(A) @ 1m

Manufactured by Peak Scientific Instruments

Hydrogen Generators

- Produces 99.9995% pure Hydrogen
- Three models - 200, 300 & 600 cc/min flow rates
- 100 psi delivery pressure
- Internal self diagnostic system check
- Leak detection with alarms and auto shutdown
- Automatic water loading pump

Manufactured by Peak Scientific Instruments

The laboratory range of gas generators covers the high purity needs of analytical instruments and laboratory equipment including specifically designed systems for LC/MS/MS instruments and AP LC/MS/MS instruments. The laboratory gas generators are manufactured by Peak Scientific Instruments and the range includes:

- air nitrogen generators
- automatic changeover switch
- calibration gas generators
- compressed air dryers/purifiers
- gas stations for API LC/MS/MS analysers
- hydrogen generators
- nitrogen generators for LC/MS/MS analysers
- nitrogen generators – membrane systems
- nitrogen generators – PSA systems
- purge gas generators
- TOC gas generators
- zero air generators

We can supply a gas generator to meet the needs of the following laboratory gas applications:

- Autoclaves • Circular dichroism • CO₂ analysers • Curing • DMA • DSC • ELSD • FT-IR
- Fume cupboards • ICP • GC – AED • GC – ECD
- GC – FID • GC – FPC • GC – FPD • GC – NPD
- GC – TCD • Glove Boxes • LC/MS/MS API
- LC/MS/MS • LC/MS/MS MSQ (MSQ+)
- NMR • Sample preparation • TGA • THA
- TMA • TOC-NPOC • TOC-TC-IC • TOD



Model NM32LA



Model ABN 2ZA

Don't miss out on this opportunity to see the newest range of gas generators for laboratory applications and also discuss your gas generating needs.

PRODUCTS – LABORATORIES

PRODUCT FOCUS - AIR NITROGEN GENERATOR

Range: ANG Generator
Gas Produced: Nitrogen & Air
Applications: DSC, GC, GC-FID, GC-FPD

The ANG Range of Air and Nitrogen Generators are designed specifically for use with GC Applications. Models are available with different flow rates and can be used with multiple instruments. The generators are provided with an internal air compressor or supplied ready to connect to an existing air supply.

	ANG250(A)	ANG600(A)	ANG1000(A)	ANG3000(A)
UHP Nitrogen	250 cc/min	600 cc/min	1000 cc/min	3000 cc/min
Dry Air	1200 cc/min	1500 cc/min	1500 cc/min	3000 cc/min
Max Output Pressure	5.5 bar / 80 psi			
Pressure Dewpoint	-70°C			
Outlet Port	1x 1/4" BSP Female			
Electrical Requirements	230v 50Hz 2.5A			230v/50Hz 3A
Power Consumption	230v - 575W			230v - 690W
Dimensions (cm) WxDxH	43 x 41 x 88			43 x 41 x 123
Weight (kg)	62	62	75	100

Principle of Operation

The high purity Nitrogen Generator utilises a 'Pressure Swing Adsorption' (PSA) method to extract pure nitrogen from air. This is where unwanted gases can be selectively adsorbed from compressed air into a porous carbon molecular sieve material (CMS). The Peak Scientific Instruments Ltd. generator utilises a unique single column system where the column is alternately pressurised and vented under a finely tuned timing cycle. The rates of pressurisation and venting are accurately set which guarantees high purity better than can be achieved with a similarly sized traditional 2-column system.

Air is drawn into the system by the Compressor (1) and passed via the Heat Exchanger (2) and the Filter / Separator (4) into the CMS Column

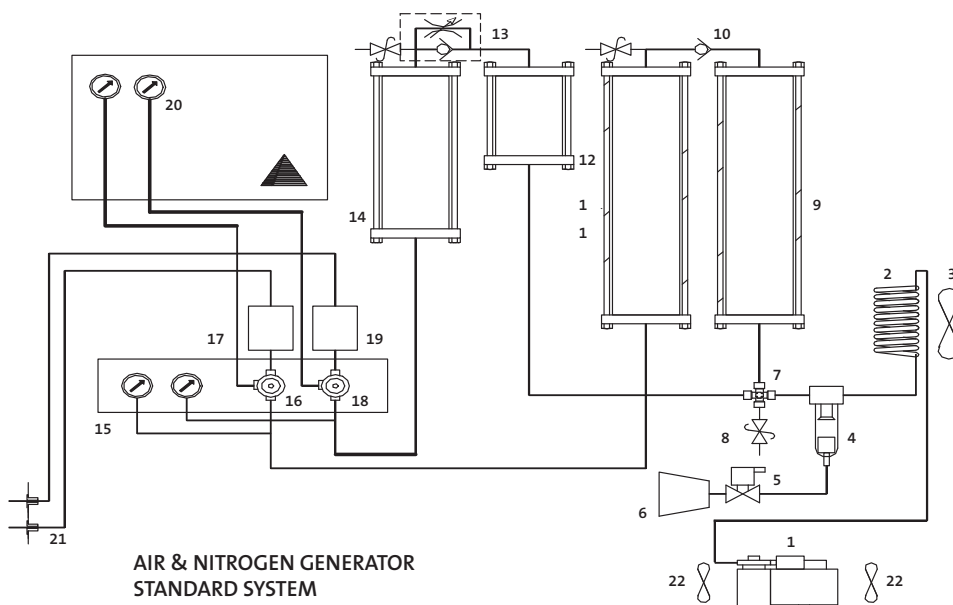
(9). Oxygen molecules in the air are trapped by the sieve however the molecules of Nitrogen pass straight through and be collected in the Nitrogen Storage Tank (10). Similarly air also passes into the Desiccant Column (12) where moisture, CO₂ and other impurities are trapped allowing clean air to pass to the Air Storage Tank (14). After a time interval the compressor is stopped and the Exhaust Valve (5) opens allowing the columns to vent to atmosphere. The trapped Oxygen and impurities are liberated and escape to atmosphere via the Exhaust Valve (5) and the Silencer (6). The generated Nitrogen in the storage tank is regulated to the correct pressure and flow rate. After another time interval the Exhaust Valve shuts and the compressor starts. This cycle runs continuously.



Air & Nitrogen Generator with integral air compressor

PARTS LIST

- | | |
|----------------------------|---|
| 1. Compressor | 12. Desiccant Column |
| 2. Cooling Coil | 13. Purge Bleed Valve |
| 3. Cooling Fan (if fitted) | 14. Air Storage Tank |
| 4. Filter / Separator | 15. Internal Gauge Rail |
| 5. Exhaust Valve | 16. Nitrogen Pressure Regulator |
| 6. Exhaust Silencer | 17. Nitrogen Flow Regulator |
| 7. Manifold X-Piece | 18. Air Pressure Regulator |
| 8. Relief Valve | 19. Air Flow Regulator |
| 9. CMS Column | 20. Front Panel Gauges |
| 10. Non-Return Valve | 21. Gas Outlets |
| 11. Nitrogen Storage Tank | 22. Compressor Cooling Fans (if fitted) |



SERVICE & MAINTENANCE

TWO SERVICE PLANS ARE AVAILABLE

On Site Generating Solutions through Peak Scientific Instruments offer two service plans for their Australian customers. All service is carried out by Anthony Nolan, Product Support Engineer for Peak Scientific Instruments. Anthony is based and works out of the On Site Generating Solutions office in Victoria as part of the united initiative between the companies so that the Australian customers receive additional service and support.

The Standard Service Plan, covers the basic needs of the generators. The Complete Service Plan, specifically designed for generators operating in critical environments, also includes full breakdown cover, guaranteed response times and generator upgrades if available.

STANDARD SERVICE PLAN

- All consumable parts & labour
- 10% discount on additional spare parts
- 1 or 2 maintenance visits per year (dependant upon generator/s type)

COMPLETE SERVICE PLAN

- All parts and labour
- Guaranteed response time (within 72 hours)
- 1 or 2 maintenance visits per year (dependant upon generator/s type)

Ensure you have consistent and regular maintenance carried out to maximise your generators' longevity and efficient operation.

Contact us at

service@onsitegenerating.com
to find out more about the best service plan for you generator and applications.

We will ensure that your instrument runs uninterrupted with maximum performance.

COMPANY NEWS

BROCHURES

On Site Generating Solutions has a number of industry specific – application brochures available as well as complete product information on individual gas generators. Following is a summary of the current industry – application specific brochures available:

• Gas Generation Product Brochure

The brochure covers the gas for the high purity needs of analytical instruments and laboratory equipment, as well as the larger nitrogen flow requirements for manufacturing, packaging, storage and other industrial application.

• Industrial Gas Generator Applications for Nitrogen – for manufacturing & packaging process in wine, beer & soft drink

The brochure provides an overview of the functional description of the Pressure Swing Adsorption (PSA) process of nitrogen generation plants and also an overview of nitrogen use within manufacturing & packaging

processes. It contains specifics on nitrogen use in wine, beer and soft drink. Additionally, the brochure provides three pay back scenarios for small, medium and large PSA nitrogen generator systems.

• Gas Generation for Laboratories

The brochure provides an overview of the laboratory range of gas generators with specific focus on the dedicated custom designed generators for LC/MS/MS and API LC/MS/MS Instruments. A comprehensive Product Selector Matrix is provided detailing the gas generator suitable for LC/MS instruments. In addition, a complete gas generator matrix is provided. This is a handy reference to identify (either by application, instrument manufacturer/model or gas produced) which generator is the best solution for your application.

Please request your copy by completing the information request form.



LABORATORY PRODUCTS

DEDICATED CUSTOM DESIGNED GENERATORS FOR LC/MS/MS AND API LC/MS/MS INSTRUMENTS

A range of membrane nitrogen generators and gas stations manufactured by Peak Scientific Instruments are specifically configured and validated by the mass spectrophotometer manufacturers to ensure that the generators meet the specific needs of gas supply to operate each instrument. The generators produce the required flow rates, purities and pressures needed by the instruments and provide an uninterrupted pure dry source of gas.

This range of nitrogen generators are quiet in operation and utilise separation technology to selectively remove oxygen, moisture and other gases and leave clean, dry and phthalate free gas. The generators are simple to install and are suitable for most instrument applications. The generators can be connected to an existing clean and dry air supply or supplied with either an external or internal compressor. Generators

are available to meet the flow requirements of single or multiple instruments.

The generators utilise hollow fibre membrane technology to efficiently separate nitrogen from other gases present in ambient air. The membrane operates on the principle of selective permeation where "fast" gases such as H₂O, O, CO₂ and O₂ permeate the membrane wall while "slow" gases (N₂ and Air) continue along and through the membrane tube for collection and use.

There is a dedicated gas generator to suit single or multiple LC/MS instruments that will meet the flow, purity and pressure requirements of the following instrument manufacturers range:

- Agilent
- Bruker
- Shimadzu
- Varian
- AB SCIEX
- Perkin Elmer
- Thermo Scientific
- Waters

Visit us at

ANZFSS (Stand No. 46),

HUPO (Stand No. 11) and

Metabolomics (Stand No. 1)

to see the range of Peak

gas generators and discuss

your requirements.



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