



High Purity Hydrogen Generators

Nitrogen Generators

Zero Air Generators

CO2 Free Air Generators

Gas Mixers & Gas Blenders

Gas Metering Systems & Gas Analysers

Compressed Air Supply and Treatment

Onsite Laboratory Gas Generation

Generate high purity laboratory gases onsite for all of your analytical applications

AiroGen[®]
laboratory gas generators




IATT[®]
INDEPENDENT AIR TREATMENT TECHNOLOGY LTD.

Service Excellence!

IATT - Onsite Laboratory Gas Generation

IATT are a truly Independent Air Treatment Technology company. Offering a wide range of equipment from compressed air supply, air filtration, condensate management to desiccant & refrigeration air dryers and onsite laboratory Hydrogen, Nitrogen and Zero Air gas generators. IATT has a solution to solve all kinds of challenges you may face in demanding laboratory and analytical applications.

Laboratory Gas Generators

IATT offer a comprehensive service which includes the selection of the correct Laboratory Gas Generator for your analytical needs together with the compressed air supply and pre-treatment required. We offer turnkey projects which provide you with a ready to use system with the minimum of disruption to your laboratory services.

Responsive Maintenance

IATT provide Rapid Responsive Maintenance programmes for your Compressed Air Supply, Air Treatment and Laboratory Gas Generation equipment. Our team of factory trained engineers are located throughout the UK and will always ensure to minimise laboratory downtime.

Maintenance Contracts

IATT offers a range of Maintenance Contracts to cover your compressed air treatment and laboratory gas generation systems. UK wide services by our factory trained engineers include spare parts, system function/upgrades and integrity checks.

Supply - Install - Service



Service Excellence!

When it comes to your Onsite Laboratory Gas Generation and Compressed Air and Air Treatment, No matter...

- What you require,**
- Where you are in the UK,**
- What your problem is,**
- Whether you are large or small,**
- IATT have a solution for you!**

IATT always provide service that is efficient, effective, economical and equitable – e4 we call it. You might think this is revolutionary – to us at IATT it's standard practice with the added ingredient...

... Service Excellence!



What is e4...
Our Service Excellence means to you:

- efficient**
effective without wasting time, effort or expense
- effective**
producing an intended result to ensure your plant is ready for operation
- economical**
using the minimum of time or resources necessary at a cost effective price
- equitable**
fair to all parties as determined by reason and conscience



High Purity Hydrogen Generators And Hydrogen Generators

- Using hydrogen as a GC carrier gas increases analysis speed and sensitivity when compared to helium and nitrogen. As H2 requires lower elution temperatures, when used as a carrier gas it improves column service life.

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Nitrogen Generators – Laboratory and High Flow

- Increased laboratory efficiency with a constant and guaranteed flow of instrument grade nitrogen. Use of N2 improves instrument stability and gives greater reproducibility of results.

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Zero Air

- The low and constant hydrocarbon content of Zero Air helps improve baseline stability of combustion detectors and reduces the frequency of recalibrations.

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Air & Gas Systems

- Gas Mixers, Gas Blenders & Gas Metering Systems, Gas Analysers, Compressed Air Supply Systems, Filtration, Air Treatment Equipment, Additional Products and Services.

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Onsite Laboratory Gas Generation - Benefits

AiroGen® Onsite Laboratory Gas Generators offer a safe, easy to use, economical and efficient technology for high purity H₂, N₂ and ZERO AIR analytical grade laboratory gases on demand – High Purity Gases where you need them when you need them without the need for gas cylinders.

- High Performance with High Purity Gas Generation
- Improved Analysis Results
- Easy to Use and Operate
- Innovative Design with Unique Modular Concept
- Cost Effective and Space Saving
- Reliable, Accurate and Functional Control
- No Hazardous Gas Cylinders Required
- Quiet and Safe to Use



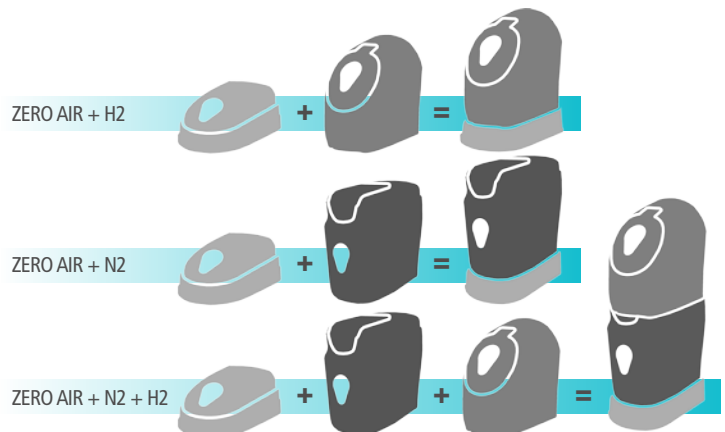
All Laboratory Gas Generators supplied by IATT carry a 2 year or 8000 hours warranty which can be supported by IO/OQ certification (Installation Qualification/Operation Qualification) on request.

AiroGen® Modular Concept

Onsite Laboratory Gas Generators from IATT can be stacked to form compact gas station solutions depending on your requirements. Combinations are available for single and multiple laboratory gas generation applications.

Here are some example combinations:

Laboratory Gas Generators from IATT provide real benefits and improve your analysis



Hydrogen Gas Generation

How Onsite Hydrogen Generation Works

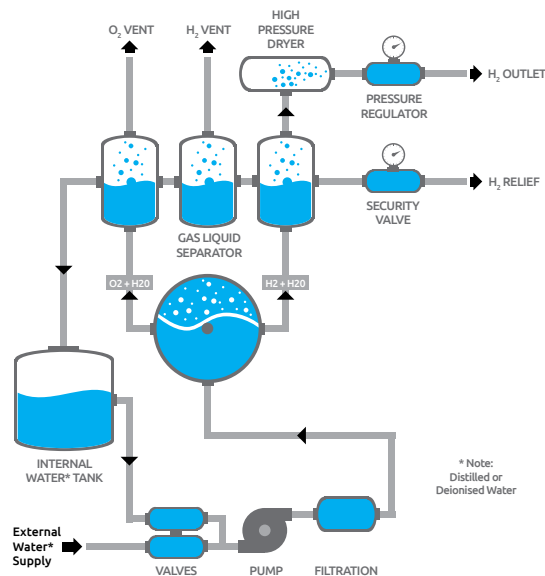
IATT AiroGen[®] High Purity Hydrogen generators use Proton Exchange Membrane (PEM) technology to separate distilled or deionised water into its two main constituent gases of hydrogen and oxygen using hydrolysis.

How PEM Hydrogen Generation Works...

From an external water supply distilled or deionised water is pumped through a filter to remove any solid contamination. The clean purified water then passes into the Proton Exchange Membrane (PEM) where electrolytic dissociation separates the water into its two main components: hydrogen ready for analytical use, and oxygen that is released into the atmosphere.

The hydrogen for laboratory analytical use is then passed through either an integral single or double column desiccant dryer. No desiccant cartridge maintenance is required when using the double column dryer with automatic regeneration. This automatic drying system ensures the highest purity grade of hydrogen for analytical applications. No acid nor alkaline solutions are used in the hydrogen generation cycle.

What is Hydrolysis? – Hydrolysis, also known as Electrolysis, is the separation of water into oxygen and hydrogen gas due to an electric current being passed through the water. In an application such as Laboratory Hydrogen Gas Generation this takes place within a specially developed polymer electrolyte membrane.



**Proton Exchange Membrane (PEM)
Hydrogen Generation**

Improved chromatography results with
Onsite High Purity Hydrogen Generation

High Purity Hydrogen Generators

IATT

For GC Carrier Gas and GCMS Applications

Applications: GC-FID / NPD / FPD / TCD / GC-Carrier Gas / GCMS / ICPMS / Collision Cell / THA



AiroGen® High Purity Hydrogen Generators from IATT use the latest Proton Exchange Membrane (PEM) technology to produce pure hydrogen from distilled or deionised water by hydrolysis.

IATT offer 2 types of AiroGen® High Purity Hydrogen Generators in this range:

Type 1 - uses a single column desiccant cartridge dryer unit with programmable automatic regeneration via an integrated calendar.

Type 2 - uses an exclusive double gas column dryer regeneration system that eliminates maintenance downtime that is typical of other systems, giving you the guarantee of high purity hydrogen at all times.

Features

High level of operator safety

- Unique 9 stage, fail safe, explosion protection system.
- Automatic internal/external H₂ leak detection.
- Patented electronically controlled gas/water separator.
- H₂ Sensor option for carrier gas use.

Excellent user interface

- LCD touch screen showing H₂ pressure, H₂ flow rate, water quality, water level in real time and system status with auto-diagnostic in case of alarms.

High quality PEM technology

- Continuous monitoring of vital parameters.
- Unique PEM cell construction and water quality management ensure reliability and longevity of the cell.
- 2 years cell warranty.

Unique features

- Canister filling mode enable filling of a large canister to a pressure of 16 bar to enable portable GC field applications.
- Auto refill water tank in standard for most of the range.
- Remote PC monitoring in standard via RS232 or RS485 to interface the unit with PC software.
- Capable of working in parallel mode.

Purity

Type 1:

H₂: >99.9999%

Type 2:

H₂: >99.99999%

Get all the benefits of High Purity Hydrogen as a carrier gas... safely!

Hydrogen Generators

For GC Fuel Gas Applications

Applications: GC-FID / NPD / FPD / TCD / THA

This AiroGen[®] range of Hydrogen Generators from IATT use the latest Proton Exchange Membrane (PEM) technology to produce pure hydrogen from distilled or deionised water by hydrolysis. They are ideal for supplying hydrogen fuel gas to all known combustion detectors used routinely in GC and THA.

The Benefits of Using Hydrogen as Fuel Gas

- Eliminates inconvenient and dangerous hydrogen cylinders from the laboratory.
- Increases the accuracy of analyses and reduces the cleaning requirement of the detector.

Features

High level of operator safety

- Unique 9 stage, fail safe, explosion protection system.
- Automatic internal/external H₂ leak detection.
- Patented electronically controlled gas/water separator.
- H₂ Sensor option for carrier gas use.

Excellent user interface

- LCD touch screen showing in real time H₂ pressure, H₂ flow rate, desiccant cartridge saturation %, water quality, water level and status of the system with alarms and auto diagnostics.

High quality PEM technology

- Continuous monitoring of vital parameters.
- Unique PEM cell construction and water quality management ensure reliability and longevity of the cell.
- 2 years cell warranty.

Unique features

- Auto refill water tank is standard for most of the range.
- Remote PC monitoring in standard via RS232 or RS485 to interface the unit with PC software.
- Capable of working in parallel mode.



Purity

Type 1:

H₂: >99.9995%

Type 2:

H₂: >99.9995%

IATT Turnkey Projects provide a ready to use system with minimum of disruption

FID Gas Station

IATT

For GC Fuel Gas Applications

Applications: GC-FID

The AiroGen® FID Gas Station from IATT combines a Hydrogen Generator and Zero Air Generator into one stackable unit. Hydrogen gas is produced from deionised water using a Proton Exchange Membrane (PEM) Technology. Zero Air is produced by purifying clean, dry compressed air sourced from the air system to a total hydrocarbon concentration of < 0.05 ppm (measured as methane).

The Benefits of Using Hydrogen for GC Fuel Gas Applications

Improved Chromatograph Results

- The reduction of hydrocarbons with the Zero Air, including methane to < 0.05 ppm decreases the background noise level and gives much better baseline stability, considerably increasing detector sensitivity ensuring precise analytical results.
- The use of hydrogen as Fuel Gas increases the accuracy of analysis and reduces the cleaning requirement of the detector.

Features

- Stacked Modular Design
- Saves space on the workbench



IATT offer a comprehensive service including the selection of the correct Laboratory Gas Generator for your analytical needs

Purity

H₂: 99.9995%
Zero: < 1 ppm
CH₄ < 0.05 ppm
CO < 0.05 ppm

Rack Mounted Hydrogen Generator

For GC Fuel Gas and Carrier Gas Applications

Applications: GC-FID / NPD / FPD/TCD / THA and Carrier Gas



This range of AiroGen[®] Rack Mounted Hydrogen Generators from IATT use the latest Proton Exchange Membrane (PEM) technology to produce pure hydrogen from distilled or deionised water by hydrolysis. They are ideal for GC Fuel Gas and Carrier Gas Applications

The Benefits of Using Hydrogen as Fuel Gas

- Eliminates inconvenient and dangerous hydrogen cylinders from the laboratory. Increases the accuracy of analyses and reduces the cleaning requirement of the detector.

The Benefits of Using Hydrogen as Carrier Gas

- The use of hydrogen as a carrier gas allows lower temperature elution, thus extending the life of the chromatograph column. Hydrogen as a carrier gas is faster and more sensitive than the more expensive helium. Run time savings of 25% to 35% without a decline in resolution. Rack mounting saves space on the workbench.

Features

- Patented electronically controlled gas/water separator.
- LCD touch screen showing in real time H₂ pressure, H₂ flow rate, desiccant cartridge saturation %, water quality, water level, and status of the system with auto-diagnostic in case of alarms.
- Canister filling mode enable filling of a large canister to a pressure of 16 bar to enable portable GC field applications.
- Auto refill water tank is standard for most of the range.
- Remote PC monitoring in standard via RS232 or RS485 to interface the unit with PC software.
- Capable of working in parallel mode.
- Internal water tank level of 1.2L electronically controlled (when needed it is filled from an external tank automatically by a single tube).

High purity analysis grade gases for improved performance

Purity

Type 1:
H₂: >99.9995%

Type 2:
H₂: >99.99999%

H2-Sensor for GC-MS / GC

All the benefits of laboratory hydrogen generation as a carrier gas... Safely!

To ensure that your system is safe, IATT offer an H2 sensor. This sensor can be connected directly to the hydrogen generator.

The ability to safely detect hydrogen leaks in the GC oven is critical to any laboratory using hydrogen as a carrier gas. The H2 Sensor ensures the safe use of hydrogen in GC analysis. It does this by constantly monitoring the H2 concentrations in the GC oven and automatically switching to an inert gas supply when typically 25% LEL (Lower Explosive Limit) is reached - this important feature eliminates the risks and at the same time ensures safety.

H2 Sensor Operation

The H2 Sensor continuously monitors the atmosphere in the GC oven and transmits the data to the hydrogen generator. When the hydrogen concentration detected exceeds the threshold of safety, the hydrogen generator will be automatically shut down with an audible and visual alarm being given. The oven is immediately shut off and the cooling flap opens.

The Benefits of Using an H2 Sensor

Eliminate the risks in using Hydrogen as a Carrier Gas in GC Analysis.

- Hydrogen has long been considered as the best carrier gas for gas chromatography. In many cases hydrogen has become the carrier gas of choice since it results in fast analysis, high efficiency, reduced costs and prolonged column life.

Fast Analysis

- The diffusion rate of hydrogen and helium are roughly the same (both 3-4 times faster than nitrogen), but hydrogen is half as viscous as helium and therefore the linear gas velocity is higher and retention times are shorter in isothermal analysis.

High Efficiency

- Hydrogen has the flattest Van Deemter curve. Compared to helium and nitrogen, hydrogen needs the lowest plate number to achieve the same resolution over a large range of linear velocity.

Prolonged Column Life

- For some applications, a temperature program can be used to speed up the analysis when using helium as a carrier gas, but this may result in a shorter lifetime of the column due to higher temperatures.

Reduced Costs

- Helium, a rival to Hydrogen, has its advantages as a carrier gas for GC; but it also has key disadvantages which are cost and availability. A tank of GC quality hydrogen is approximately 3 times less expensive than its helium equivalent. The price disparity between the two will not improve as the existing helium reserves are drying up and the demand is increasing across different industries. The use of a hydrogen generator also provides long term cost savings. A hydrogen generator allows for the production of the gas on an as needed basis; which avoids the costs associated with storing gas.

The advantages of hydrogen are clear; but it does have one really big disadvantage!

- Hydrogen is an explosive gas! An undetected gas leak can occur with a broken column or a leaking connection. The danger is that an undetected gas leak could result in an explosion in the GC oven potentially placing laboratories and their personnel at risk.
- Laboratories should always comply with government health and safety regulations and ASHRAE standards.

Nitrogen Gas Generation

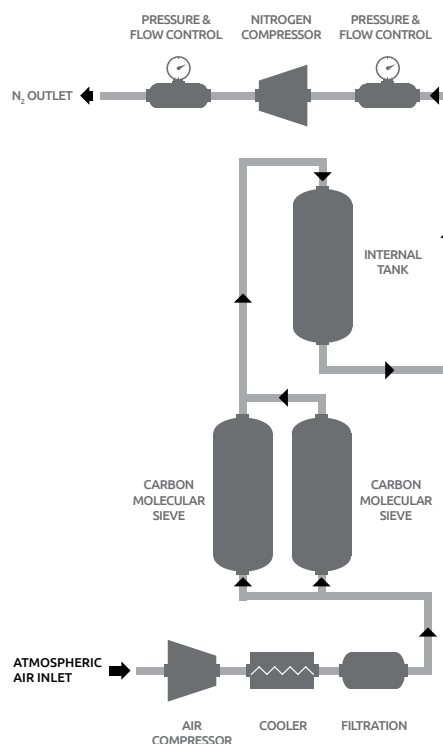
How Onsite Nitrogen Generation Works

IATT AiroGen[®] Lab Nitrogen Generators use Pressure Swing Adsorption technology (PSA) to produce pure nitrogen gas from atmospheric air supplied by an external or internal air compressor. PSA produces nitrogen purity of better than 99.5% up to 99.9999%.

PSA Nitrogen Generation is carried out using the adsorptive properties of media such as a Carbon Molecular Sieve (CMS). Oxygen and other trace gases are preferentially adsorbed onto the media at varying portions depending on the system pressure while the nitrogen passes through due to its molecular structure being too large to penetrate the fine porosity of the adsorptive media.

The system uses two pressurised twin towers to contain the adsorptive media where the clean dry compressed air enters at the bottom of one of the towers – oxygen, carbon dioxide, moisture, some hydrocarbons and trace gases are adsorbed and nitrogen passes through the adsorbent media bed into a buffer tank prior to the outlet, further filtration and onwards for use in the analytic application. After a predetermined time, dependant on the purity of nitrogen required, the tower switches to regenerative mode and flows the pressurised compressed air into the second tower (hence the term Pressure Swing...) where the process starts again. The first tower then depressurises and the adsorbed oxygen and other trace gases are released and exhausted to atmosphere.

What is Adsorption? – In a gas application such as nitrogen generation this is the accumulation of molecules of oxygen and other trace gases to form a thin film on the surface of a specifically selected solid such as carbon by intermolecular forces – the adsorption process is reversible which facilitates the constant use of the system to generate nitrogen on a commercially viable scale.



**Pressure Swing Adsorption (PSA)
Nitrogen Generation**

{ IATT Service Excellence – throughout the UK

PSA LC/MS Nitrogen Generators

IATT

Applications: LC/MS



The AiroGen® PSA LC/MS Nitrogen Generators use Pressure Swing Adsorption (PSA) technology to produce pure nitrogen gas. This technique uses a Carbon Molecular Sieve (CMS) to selectively remove oxygen and other contaminants from atmospheric air. The CMS bed alternates between purification and regeneration modes to ensure continuous nitrogen production.

LC-MS analysers do not all share the same requirements in terms of type, flow rate, pressure and purity of the gases needed for their operation; That's why the PSA LC/MS Nitrogen Generator range from IATT was developed to meet the needs of all LC/MS analyses on the market.

IATT offer 5 types of PSA LC/MS Nitrogen Generators with options for with or without built-in-air compressor.

Type 1: With max. output of 35 L/min of N2 gas.

Type 2: With max. output of 64 L/min of N2 gas.

Type 3: The dual flow, specifically designed for nebulization and collision gas requirements. The generator provides two continuous streams of nitrogen from a single 'plug & play' unit.

Types 3-4: With max. output of 15 or 25 L/min of N2 gas.

Type 5: The triple flow, specifically designed to supply Curtain, Source & Exhaust Gases with dry air and nitrogen for ABI SCIEX LCMS instruments.

Features

- Fully regenerative PSA technology - reduced risk of gas contamination and is phthalate free.
- Flow rates suited to LC-MS analyser requirements.
- Outlet pressures up to 7 barg
- HMI touch screen technology to display the process in real time for inlet/outlet pressures.
- Integral oil free compressor option on most types offers a fully secure N2 supply.
- Quiet operation using a soundproofed compressor enclosure and anti-vibration features.
- Auto start.
- Audible and alarm display with help menu.
- Visual maintenance indication.
- Outlet flow indicator.
- Trend graph for QA reporting.
- Energy saving mode: Enables the compressor to switch off when nitrogen supply is not required.
- Remote access to screen using Internet or GSM (Global Systems for Mobile communication).
- Can be fitted with wheels for mobility.

Purity

N2: >99%
to
99.999%

{ High purity onsite generation of laboratory gases with improved efficiency, economy and safety

DS-PSA Nitrogen Generators

Applications: LC/MS - For Installations Far Away From the Lab Without any Pressure Drop

AiroGen[®] DS-PSA Nitrogen Generators from IATT use Pressure Swing Adsorption (PSA) technology combined with two step pressure management to produce pure nitrogen gas with high flow, pressure and purity.

This high N₂ pressure allows installation of the N₂ generator far away from the laboratory without any pressure drop at the point of use.

The N₂ generator includes as standard a pressure switch which can be adjusted on the display. By linking the N₂ system to an external gas receiving tank, service maintenance costs are greatly reduced due to the system components being under less stress.

Benefits

- Improve analytical instruments performance - Production of a constant flow of gas improves the consistency of the analysis results and hence reproducibility.
- Improved laboratory efficiency - The relatively high gas volumes required by LCMS make cylinder supply inappropriate for such applications.
- A constant, uninterrupted gas supply eliminates interruptions of analyses to change cylinders.
- Improved economy - Quick return on investment < 1 year.
- No gas cylinder rental and no gas price increases.
- Improves safety - Nitrogen produced at low pressure and ambient temperature removes the hazards associated with high pressure cylinders and liquid dewar's.

Features

- Fully regenerative PSA technology: reduced risk of gas contamination and phthalate free.
- High pressure nitrogen > 8 bar.
- Integral oil free compressor offers a fully secure N₂ supply.
- Quiet operation using a soundproofed compressor enclosure and anti-vibration features.
- Compressor over temperature alarm.
- Auto start.
- Audible and Alarm display with help menu.
- Visual maintenance indication.
- Energy saving Mode: Enables the compressor to switch off when nitrogen supply is not required with the external N₂ tank.
- Can be fitted with wheels for mobility.



Purity

N₂: >99%

IATT provide a complete system from compressor and air treatment to laboratory application

High Pressure Nitrogen Generators

IATT

For ASE Dionex

Applications: Accelerated Solvent Extraction Devices and Pressurised Solvent Extraction Devices Working at High Pressure Level - (ASE-200, ASE-300, ASE-350 from Dionex).

The AiroGen® High Pressure Nitrogen Generator from IATT uses a Carbon Molecular Sieve (CMS) to selectively remove oxygen and other contaminants from atmospheric air. The CMS bed alternates between purification and regeneration modes to ensure continuous nitrogen production at high pressure.

Features

- Fully regenerative PSA technology - Reduces risk of gas contamination.
- High pressure nitrogen > 11 bar.
- Two nitrogen outlet lines:
 - One at 7 bar for pneumatic system
 - One at 11 bar for the extraction cells
- Integral oil free compressor offers a fully secure N2 supply.
- Quiet operation using a soundproofed compressor enclosure.
- Compressor over temperature alarm.
- Auto start.
- Audible and Alarm display with help menu.
- Visual maintenance indication.
- Energy saving Mode: Enables the compressor to switch off when nitrogen supply is not required with the external N2 tank.
- Can be fitted with wheels for mobility.



{ IATT provide Turnkey Projects - a ready to use system with the minimum of disruption to your laboratory services



MP-AES Nitrogen/Air Generators

For MP-AES Applications

Applications: Specifically designed to meet the nitrogen and dry air needs to supply a Microwave Plasma Atomic Emission Spectrometer (MP-AES) of the Agilent range.

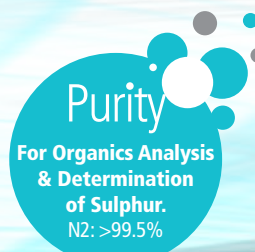
These dual flow AiroGen[®] Nitrogen/Air Generators from IATT produced by Pressure Swing Adsorption (PSA) to remove O₂, CO₂ and water from compressed air. Purified air is produced by using an activated alumina column. The generator provides two continuous streams of Nitrogen and dry air from a single 'Plug and Play' unit. The model is available with an integral oil free air compressor and is extremely quiet in operation. The Nitrogen/Air Generator is controlled using the latest in HMI touch screen technology to display the process in real time for inlet/outlet pressures.

Features

- Complete 'Plug and Play' system specifically designed for the Agilent MP-AES.
- Available with or without built-in-air oil free compressor with noise reduction technology.
- Auto start.
- Alarm display with help menu.
- Audible alarm.
- Outlet flow indicator.
- Trend graphs for QA reporting.
- Energy saving mode.



IATT provide Rapid Responsive Maintenance programmes for your Compressed Air Supply, Air Treatment and Laboratory Gas Generation equipment



High Purity Nitrogen Generators

IATT

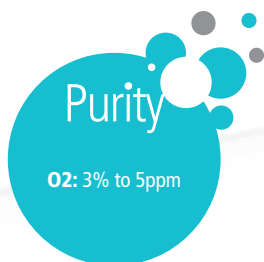
Including Zero N2 and Combined N2/Air

Applications: GC-Carrier Gas / GC-FID, NPD, ECD, AED / NMR / Dichroism Circular / ELSD / Corona / ICP / COT / Sample Evaporation / XRD

AiroGen® High Purity Nitrogen Generators from IATT produce a continuous flow of High Purity N₂ using Pressure Swing Adsorption (PSA) technology. This technology uses a combination of molecular sieves to selectively eliminate O₂ and other contaminants from the air supply.

Features

- On line purity monitoring capability with the O₂ sensor.
- Catalyst module capability: hydrocarbons level < 0.05 ppm.
- Available with or without built-in-air compressor.
- Quiet operation using a soundproofed compressor enclosure and anti-vibration features.
- Auto start.
- Audible and Alarm display with help menu.
- Visual maintenance indication.
- Outlet flow indicator.
- Trend graph for QA reporting.
- Energy saving Mode: Enables the compressor to switch off when nitrogen supply is not required.
- Remote access to screen using Internet or GSM (Global Systems for Mobile communication).
- Can be fitted with wheels for mobility.



Modular design enable stackable gas generator combinations to be used

Membrane Nitrogen Generators

Applications: LCMS / Solvent Evaporation / ELSD Detectors / Corona Detectors

IATT offer a range of Membrane Nitrogen Generators that use membrane filtration technology as the core of the process based on the selective permeation principle.

Membrane Nitrogen Generators uses filtration to separate nitrogen from atmospheric air that is passed through an air compressor into the generator. The dry compressed air stream is passed through bundles of semi-permeable hollow fibre filtration membranes that are configured into a cartridge style. Under pressure oxygen, water vapour and other trace gases, which are fast gases, readily permeate through the micro porous structure of the hollow fibre filtration membranes. The nitrogen molecules which present a speed of slower distribution stay within the membrane and pass along the hollow fibres to the outlet to be further filtered and used in the application.

The low pressure drop of Membrane Nitrogen Generators allows the unit to be connected to an existing clean, dry and oil-free compressed air supply in the laboratory. Combined nitrogen/dry air is available to meet the requirements in terms of flow, purity and pressure for ABI LC-MS applications.

Features

- Constant high purity Nitrogen.
- Saves space in the laboratory.
- Minimal maintenance.
- Touch screen control option.
- No need to handle gas cylinders.

IATT provide Rapid Responsive Maintenance programmes to ensure laboratory downtime is minimised

Purity

N₂: >99.5%

Nitrogen Generators

IATT

For high flow

Applications: NMR / Dichroism Circular / Sample Evaporation / Multiple LCMS / A Complete Lab



The range of High Flow Nitrogen Generators from IATT offer very high flow rates capable for use in large laboratory applications to industrial scale production facilities.

They use either Pressure Swing Adsorption (PSA) or Membrane Nitrogen Generation depending on the nitrogen purity required of up to 99.5% or better than 99.5% up to 99.9999%

IATT have expertise in selecting the correct onsite Nitrogen Generation system for your needs now and in the foreseeable future. When planning an installation IATT consider all of the facts and your needs:

What consumption is required?

Does consumption vary?

What pressure is required?

What purity of nitrogen is required?

Is the compressed air treatment system adequate?

Taking all of these parameters into consideration, IATT can select from an array of Nitrogen Generators best suited to your needs. This includes all of the ancillary equipment such as the air compressor, air receiver, pre filters, air dryer, compressed air filtration as well as gas control/mixing and gas analysis.



Supply - Install - Service

High flow rate generators for large usage laboratory applications

Zero Air Gas Generation

How Onsite Zero Air Generation Works

IATT AiroGen[®] Zero Air generators utilise Catalytic Reactor technology to generate high purity air that is free of moisture and hydrocarbons.

How Zero Air Generators Work

Zero Air Generators use three steps to convert ambient air into analytical grade air.

Step 1: Pre-filtration

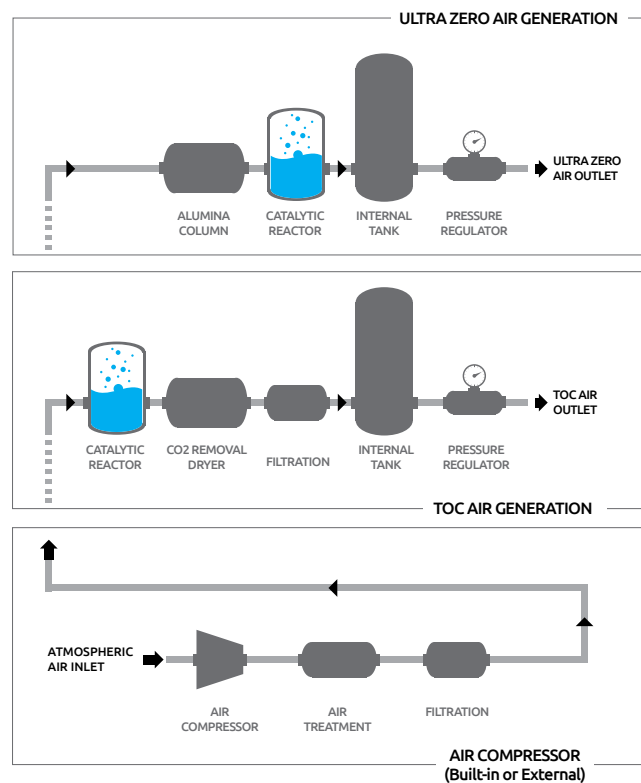
An external oil-free compressor delivers air through a high efficiency filter that removes solid particles that may damage or contaminate the system. The filter has an automatic purge system and removes oil, water and any other particles larger than 5 microns in size.

Step 2: Hydrocarbon and Carbon Monoxide trapping

The air leaving the filter enters a high-temperature platinum Catalytic Reactor, which through oxidation eliminates hydrocarbon molecules down to < 0.05 ppm. The separated gas then passes through a cooling system prior to the final stage.

Step 3: Final filtration

High-efficiency filtration is used to prevent any solid particles from entering the analytical instrument.



{ Better detector performance
and an uninterrupted gas supply
increase efficiency

Zero Air Generators

IATT

Applications: GC-FID, FPD, NPD / THA / Gas Sensing



AiroGen® Zero Air Generators from IATT produce dry and hydrocarbon-free (HC) air < 0.05 ppm, using a heated catalytic technology from a supply of clean, dry compressed air. The generator can be used individually or coupled to any one of the Modular Hydrogen Generators to form an all-in-one FID gas station solution.

Benefits

Better detector performance

- The reduction of hydrocarbons, including methane to < 0.05 ppm decreases the background noise level and gives much better baseline stability, considerably increasing detector sensitivity, ensuring precise analytical results.

Increased laboratory efficiency

- A constant, uninterrupted gas supply of guaranteed purity eliminates interruptions of analyses to change cylinders and reduces the amount of instrument re-calibration required.

Improved safety

- Zero air produced at low pressure and ambient temperature removes the need for high pressure cylinders.

Simple installation

- Zero Air generators can be installed in the laboratory, on or under a bench - eliminating the need for long gas lines from cylinders stored elsewhere. They are stackable with the range of Hydrogen Generators.

Features

- High Performance Catalyst
- Compact, modular design - For easy coupling of Modular Hydrogen Generators to form a convenient stack.
- Low maintenance – filters only need replacement once per year.
- Greater baseline stability achieved.

Purity

HC: <0.05ppm
CO: <0.05ppm
CH4: <0.05ppm

Modular Design enables Zero Air and Nitrogen generator stackable combinations

Rack Mounted Zero Air Generators

Applications: GC-FID, FPD, NPD / THA / Gas Sensing



AiroGen® Rack Mounted Zero Air Generators are also available from IATT. Using the same technology as the Zero Air Generators, they produce dry and hydrocarbon free air using clean, dry air supplied from an oil-free compressor. Designed with safety and convenience in mind, this Rack Mounted Zero Air Generator system will eliminate the need for inconvenient high pressure gas cylinders.

Rack Mounted Zero Air generators produce dry and hydrocarbon free air, using air from an oil-free compressor, thus avoiding the need to use traditional gas cylinders that are often difficult to change. They are designed with safety and convenience in mind.

{ Supply - Install - Service



AiroGen® Ultra Zero Air / TOC Air Generators from IATT are some of the most efficient Hydrocarbon-free (HC) air purifier systems for laboratory analytical applications.

The **Ultra Zero Air Generators** use a combination of high level filtration through a dryer and catalytic technology to produce clean and dry air with hydrocarbons including methane down to extremely low levels.

TOC Air Generators utilise heated catalytic technology which is combined with a CO₂ removal air dryer to remove THC including CH₄, CO₂ and a low H₂O dewpoint.

Features

- Available with or without built-in-air compressor.
- Quiet operation using a soundproofed compressor enclosure and anti-vibration features.
- Auto start.
- HMI touch screen technology to display the process in real time.
- Audible and alarm display with help menu.
- Visual maintenance indication.
- Outlet flow indicator.
- Energy saving Mode: Enables the compressor to switch off when gas supply is not required.
- Trend graph QA reporting.
- Remote access to screen using internet or GSM.
- Can be fitted with wheels for mobility.

Purity
Ultra Zero Air:
CH₄/CO/NO_x
out <0.05ppm

Purity
TOC Air:
CH₄/CO/NO_x
out <0.05ppm
CO₂ out <1ppm

{ Controlled using the latest HMI touch screen to display the process in real time

FT-IR Purge Gas Generator

Applications: FT-IR

AiroGen® FT-IR Purge Gas Generators from IATT is specifically designed for use with FT-IR spectrometers to provide a purified purge and air bearing gas supply from a clean, dry compressed air supply.

The unit provides instruments with CO₂ free compressed air at less than -70°C dewpoint with no suspended solid impurities larger than 0.01 micron 24 hours/day, 7 days/week.

Benefits

Better detector performance

- The TOC AIR generator reduces CO₂ level < 1 ppm for TOC application and Electronic Noise.
- The FT-IR Purge Gas Generator provides cleaner background spectra in a shorter period of time and more accurate analysis by improving the signal-to-noise ratio.

Increased laboratory efficiency

- A constant, uninterrupted gas supply of guaranteed purity eliminates interruptions of analyses to change cylinders and reduces the amount of instrument re-calibrations required.

Improved safety

- TOC AIR or FT-IR purge gas produced at low pressure and ambient temperature removes the need for high pressure cylinders.

Simple installation

- Gas generators can be installed in the laboratory, on or under a bench, eliminating the need for long gas lines from cylinders secured elsewhere.

Features

- Built-in-air compressor.
- Quiet operation using a soundproofed compressor enclosure and anti-vibration features.
- Auto start.
- Audible and alarm display with help menu.
- Visual maintenance indication.
- Outlet flow indicator.
- Energy Saving Mode: Enables the compressor to switch off when Air Purge Gas supply is not required.
- Increases FT-IR sample throughput and maximizes up-time.
- Improves signal-to-noise ratio even on non-purge systems.
- Can be fitted with wheels for mobility.



IATT team of factory trained engineers are located throughout the UK

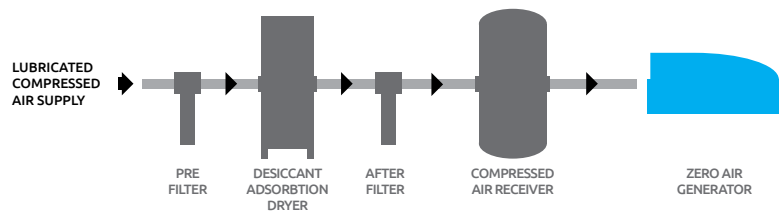
Laboratory Gas Installation Examples

IATT are expert in the design, supply, installation and service of complete compressed air treatment systems and laboratory gas generation systems for any application. Whether you have an existing compressed air supply or need a new installation, IATT have a dedicated team of factory trained engineers strategically located throughout the UK that can advise and work with you to provide the optimum solution to your laboratory gas generation needs – Service Excellence.

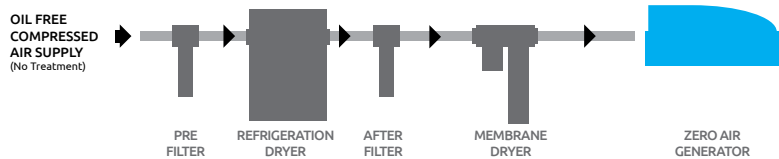
The following are examples of typical Laboratory Gas installations:

Zero Air Treatment Recommendation if the Unit Is Connected to:

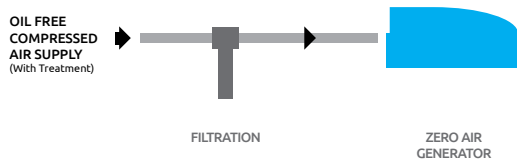
Compressed Air Supply from a Lubricated Compressor



Compressed Air Supply from an Oil-free Compressor with no Air Treatment

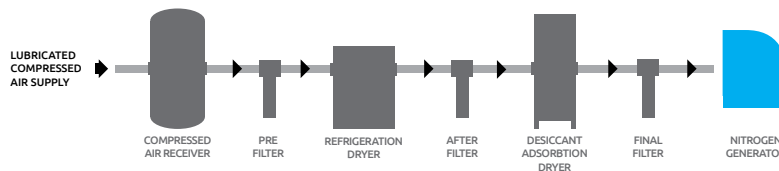


Compressed Air Supply from an Oil-free Compressor with Air Treatment

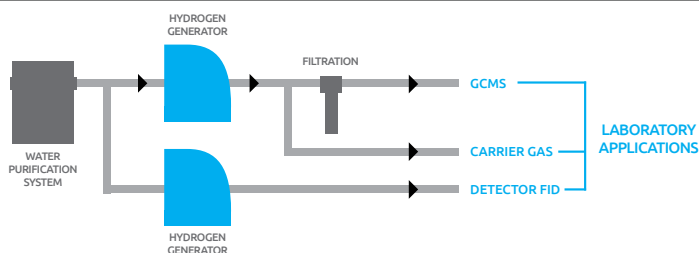


High Purity Nitrogen Treatment Recommendation if the Unit Is Connected to:

Compressed Air Supply from a Lubricated Compressor



Hydrogen Generator



Gas Mixers, Gas Blenders and Gas Metering Systems

IATT

When a mixture of gases is required for laboratory applications and other specialised applications, IATT can provide the equipment for the process.

IATT offer the high quality WITT® range of Gas Mixers, Gas Blenders and Gas Metering Systems for use when two or more gases are required to be mixed. They are ideal for controlling the optimal gas mixture for low and high flow rates especially where there is a highly fluctuating gas demand.

These state-of-the-art mechanical or electronic gas mixing systems provide accuracy and process safety allowing convenient control of the gas mixer and control mixing systems via Intranet, Internet or mobile devices.



Gas Analysers

Gas purity is essential in many hydrogen, nitrogen and mixed gas laboratory applications. Use of portable or stationary gas analysers ensures your process is secure and gas supply quality is maintained.

IATT offer the high quality WITT® range of Gas Analysers that are fast, precise and multifunctional. The gas analysers are used as stationary or portable units for sample or continuous gas analysis for almost any gas application. They can be supplied as standalone units or integrated into gas mixing systems.

Intuitive and easy handling of the gas analysis is provided by intelligent operating controls. State-of-the-art sensors and intelligent software solutions guarantee accurate measurement results and ensure the quality of your processes.



Onsite Gas Generation – Industrial Scale

In addition to the comprehensive range of Laboratory Gas Generators, IATT also supply, install and service High Flow Onsite Nitrogen and Oxygen Generators for industrial scale applications.

These include:

- Food Industry Applications** - packaging, storing and transporting foods products
- Modified Atmosphere Packaging (MAP)** - for better quality and shelf life.
- Beverage and Drinks Industry** - production, dispensing and winemaking.
- Steel and Metals Fabrication** - laser cutting, welding and brazing.
- Plastics Industry** - injection moulding and blanketing for adhesive curing.
- Oil & Gas** - off shore platforms, oil extraction, refineries, pipeline drying/inerting/pigging.
- Electronics Production** - wave soldering and reflow soldering.



Compressed Air Supply Systems

IATT

Clean dry compressed air for use in laboratory and analytical applications.

To ensure that your Onsite Laboratory Gas Generation System operates efficiently and has an adequate, clean and dry supply of compressed air, IATT also supply, install and service:

Compressed Air System Design

Compressed Air Filtration – Replacement Filter Elements

Desiccant & Refrigeration Dryers – Air Treatment Equipment

Condensate Management – Compressed Air Equipment

Responsive Maintenance – UK Wide

Compressed Air and System Design

IATT Supply, Install and Service a wide range of Compressed Air Systems, Filtration, Air and Gas Treatment, Refrigeration Dryers, Desiccant Dryers and Onsite Gas Generation Technology to provide the best compressed air and gas quality for laboratory applications.

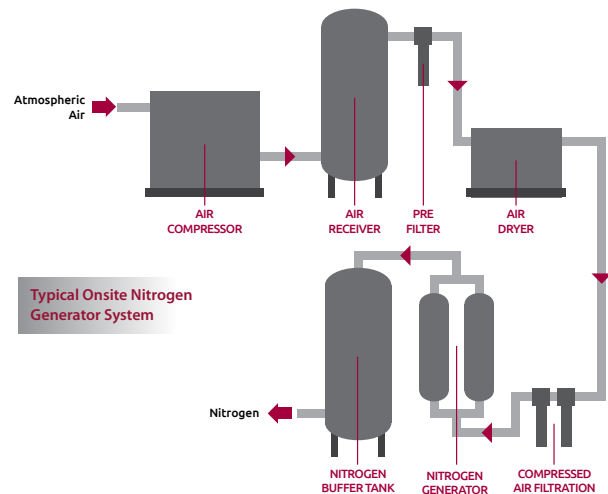
Compressed Air Filtration

A comprehensive range of compressed air filters that range from 0.5-15000 scfm and grades 0.01-25 micron with oil vapour removal down to 0.003 mg/m³.

The range includes high efficiency filter housings with pipe sizes ¼" - 3" BSP and flanged vessels from DN80 – DN300. They cover from low to high pressures up to 350 barg (5000 psig).

Breathing Air

A full range of breathing air packs and systems from a 2 man station to full medical air treatment packages. All equipment is designed and



manufactured in line with the latest BS, HTM and European Pharmacopeia standards. All systems can be installed and validated in line with current legislation and have remote and additional alarms for added peace of mind.

Replacement Filter Elements

These include: Compressed Air Filters, Process Filter, Medical/Sterile Air Filters, Vacuum Filters, Autoclave/Vent Filters, Panel Filters, Activated Carbon Filters, Hepa Filters, Bag Filters, Foam Filters / Filter Rolls, Intake Filters, Gas Filters.

System Validation

IATT offer filter and system validation packages tailored to meet your specific needs covering compatibility, efficiency, integrity, microbiological removal, sterilisation regimes, particulate removal, oil carryover, leaks, pressure differential, flow rate and throughput.

Compressed Air Treatment

Desiccant & Refrigeration Dryers

Heatless Desiccant Air Dryers

IATT offer a complete range of heatless desiccant air dryers suitable for drying air from -20°C to -70°C. All units have purge economy fitted as standard giving significant energy savings as the dryer only operates when the compressor operates, all controlled by an intelligent electronic processor.

Refrigeration Dryers

Refrigeration Dryers IATT supply are robust, economical and reliable. Using the latest technologies and energy efficient heat exchangers results in a compact simple to use dryer.

Compressed Air Treatment Equipment

Condensate Management

Automatic Drains with zero loss and condensate drain with electronic level control for applications.

Oil-Water Separation

The IATT range of Oil-Water Separation units offer a uniquely designed filter range, avoiding the problematic weir system most other units employ.

Carbon Bag Maintenance Kits

We also supply a complete range of original and alternative carbon bag maintenance kits.

Application Guide

GAS CHROMATOGRAPHY

Instrument	Gas used	Purity	Flow rate	Product
GC - FID	Hydrogen for detector	Hydrogen high purity	30 to 50 mL/min	Hydrogen
	Zero air for detector	Without hydrocarbon	300 to 500 mL/min	Air Zero
	Hydrogen for Carrier gas	Hydrogen high purity	10 mL/min	Hydrogen
	Nitrogen for Carrier gas	Nitrogen high purity, Zero N2	20 to 50 mL/min	Nitrogen
	Nitrogen for Make-up	Nitrogen high purity, Zero N2	30 to 50 mL/min	Nitrogen
GC - FPD	Hydrogen for detector	Hydrogen high purity	60 to 90 mL/min	Hydrogen
	Zero air for detector	without hydrocarbon	90 to 120 mL/min	Zero Air
	Hydrogen for Carrier gas	Hydrogen high purity	10 mL/min	Hydrogen
	Nitrogen for Carrier gas	Nitrogen high purity, Zero N2	20 to 50 mL/min	Nitrogen
	Nitrogen for Make-up	Nitrogen high purity, Zero N2	30 to 50 mL/min	Nitrogen
GC - NPD	Hydrogen for detector	Hydrogen high purity	50 mL/min	Hydrogen
	Nitrogen for Carrier gas	Nitrogen high purity, Zero N2	20 to 50 mL/min	Nitrogen
	Nitrogen for Make-up	Nitrogen high purity, Zero N2	30 to 50 mL/min	Nitrogen
GC - ECD	Nitrogen for Carrier gas	Nitrogen high purity, Zero N2	30 mL/min	Nitrogen
	Nitrogen for Make-up	Nitrogen high purity, Zero N2	60 mL/min	Nitrogen
GC - TCD	Hydrogen for Carrier gas	Hydrogen high purity	100 mL/min	Hydrogen
	Nitrogen for Carrier gas	Nitrogen high purity	100 mL/min	Nitrogen
GC - FPC	Nitrogen for Make-up	Nitrogen high purity, Zero N2	30 to 50 mL/min	Nitrogen
GC - ATD	Zero air	<0,05ppm hydrocarbons	< 2 L/min	Zero Air
GC - AED	Nitrogen for Carrier gas	Nitrogen high purity, Zero N2	< 1 L/min	Nitrogen
GC - ELCD	Hydrogen for reaction gas	Hydrogen high purity	70 to 200 mL/min	Hydrogen
GC-IR	Air without CO2 for FT-IR	Dry air without CO2	14 to 85L/min	Dryer without CO2
GC-MS	Carrier gas	Nitrogen or hydrogen high purity	-	Zero Nitrogen or Hydrogen
FAST-GC	Hydrogen high pressure	Hydrogen high pressure	-	Hydrogen

SPECTROSCOPY

Instrument	Gas used	Purity	Flow rate	Product
FT-IR	Purge gas for sample compartment, optics, air bearing and microscope	Dry Air without CO2	15 to 85 L/mn	CO2 Removal Air Dryer
RMN	Air for lifting spinning and ejecting	Dry Air	300 L/mn	Dry Air
ICP	Nitrogen or Zero Nitrogen for purge gas	> 99,9995 %	1 to 9 L/mn	Nitrogen
ICP-MS	Collision gas in plasma chamber	> 99,99999 %	80 ml/min	Hydrogen
AA	Air for oxidant gas	Dry Air	28 to 200 L/min	Air Dryer

DETECTORS

Instrument	Gas used	Purity	Flow rate	Product
CORONA	nitrogen	98%	Up to 6 L/min	Nitrogen
ELSD	Air for nebulisation	Dry air	2-6 L/min	Dryer
	Nitrogen for nebulisation	Nitrogen	4 –8 L/min	Nitrogen

ANALYSERS

Instrument	Gas used	Purity	Flow rate	Product
COT	Dry air or nitrogen for carrier gas and combustion gas	CO2-free dry air, without hydrocarbon	100 to 700 mL/min	Air TOC series
		High purity nitrogen	50 to 700 mL/min	Nitrogen
CO2 Analyser	Calibration	CO2-free dry air, without hydrocarbon	550 to 1000 mL/min	UZAG or Air TOC series
DSC	Dry air	Dry air	100 mL/min	Air Dryer
	Curtain gas	High purity nitrogen	100 mL/min	Nitrogen
TGA	Dry air or Nitrogen for furnace	Nitrogen : 99.5%-3b or dry Air	4-200 mL/min	Air Dryer, Nitrogen
DMA	Dry air or Nitrogen for furnace and drive bearings	High purity nitrogen or dry air	-	Air Dryer, Nitrogen
THA	Hydrogen and Zero air for FID detector	Hydrogen and air without hydrocarbon	-	Zero Air and Hydrogen
TMA	Nitrogen for furnace	High purity nitrogen	<1L/min	Nitrogen
TOD	-	High purity nitrogen	<600ml/min	Nitrogen

LCMS

Instrument	Gas used	Purity	Flow rate	Product
LCMS / MS, TOF	Nitrogen for curtain gas	99%	Up to 64 L/min	Nitrogen
			Depending on LCMS models	
AB SCIEX	Curtain Gas	Nitrogen only	Curtain Gas :	Nitrogen
			12 L/min @ 5.52 bar	
			Source Gas :	
	24 L/min @ 7.58 bar			
	Exhaust Gas :			
	8 L/min @ 4.14 bar			
Curtain Gas	Nitrogen and dry air	Curtain Gas (Nitrogen)	Nitrogen	
		12 L/min @ 5.52 bar		
		Source Gas (Dry Air)		
24 L/min @ 7.58 bar				
Exhaust Gas (Dry Air)				
8 L/min @ 4.14 bar				

OTHER APPLICATIONS

Instrument	Gas used	Purity	Flow rate
Solvent evaporation	Nitrogen for solvent evaporation from 95 % to 99 %	Approx. 130 L/min	Nitrogen
TurboVaps	Air for pneumatic control	28 L/min	Dry Air
	Nitrogen for auto-sampler	550 mL/min	Nitrogen
Circular dichroism	Nitrogen @ 99.999 %	up 15 L/min	Nitrogen
Laser Diffraction	Clean and dry air for nebulizing gas	Depend on model	Air Dryer
Hydrogenation	Hydrogen	Depend on model	Hydrogen
Glove box / cover	Nitrogen or dy air	Depend on model	Nitrogen or Dry Air
Fuel cells	Hydrogen High purity	Depend on model	Hydrogen
Rheometer	Dry air	Depend on model	Dry Air
ASE DIONEX	Nitrogen @ 10 bars	20 L/min	Nitrogen

IATT Service & Support

As part of our commitment to Service Excellence we provide comprehensive Service and Support throughout the UK.

We have expertise from compressor intake, through to your treatment systems right through to your point of use equipment and processes. Our specialists also provide professional independent advice for the selection, supply and installation of new equipment, spare parts as well as plant service and maintenance contracts.

Independent Approach

We believe that as a truly independent air treatment technology company, IATT will provide you with the very best solution for you and your organisation. Our independence from manufacturers gives us the capability to select the correct equipment for your process without bias.

Ensuring that your compressed air treatment and onsite nitrogen gas generator plant runs efficiently is what IATT do – no matter where your business is situated in the UK, we have highly skilled and experienced factory trained engineers close to you.

For service & support contact us on:
t. 0191 477 0060 or email: **info@iatt.co.uk**

Service Excellence!



Independent Air Treatment Technology Ltd.
Unit 11 Saltmeadows Trade Park
Neilson Road
Gateshead
Tyne & Wear
NE10 0EQ
t. 0191 477 0060
f. 0191 477 2228
e. info@iatt.co.uk
www.iatt.co.uk

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Co. Reg: 07115308 | VAT Reg: 982712988

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This is what our e4
Service Excellence
means to you...

efficient
effective
economical
equitable