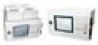
LDetek

Where innovation leads to success

- Home
- OUR PRODUCTS
  -  PLASMADETEK

    Plasma Emission Detector
  -  MULTIDETEK 2

    Compact gas chromatograph
  -  LD8000

    Online Trace Nitrogen in Argon, Helium and Crude..
  -  LDP1000

    Gas purifier for noble, nitrogen or hydrogen gases
  -  PLASMADETEK 2

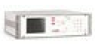
    Plasma Emission Detector
  -  LabDetek

    Laboratory Chassis
  -  LD8000+

    Online Trace PPB Nitrogen in Argon/Helium Analyzer
  -  TRAPS AND ACCESSORIES
  -  PLASMADETEK 3

    Plasma Emission Detector
  -  LDGSS

    High Purity Gas Stream Selector
  -  LD8000 MultiGas

    Multigas online gas analysis solution
  -  LD2000

    Online Trace Hydrocarbons Analyzer
  -  LDGDS

    Gas Dilution System

- APPLICATIONS
  - Applications notes
  - Chromatograms

Environment

LD16-13 - Measurement of Greenhouse gases GHG

AN-LD16-13.pdf (1,33 Mo) Energy (fossil fuel) and agriculture required for human activities on Earth produce Greenhouse gases (GHG) such as Carbon Dioxide (CO2), Methane (CH4), Nitrous Oxide (N2O) and Fluorinated gases mainly Sulfur Hexafluoride (SF6). These gases tend to absorb infrared radiation emitted by the Earth surface resulting to reduce the atmospheric heat loss into space and keeping Earth warmer.

LD16-01 - Air analysis using the MultiDetek2 and PlasmaDetek2

Application note_LD16-01 (955 Ko) The air analysis for environmental applications is more and more required in different regions of the world. In this application note, the trace analysis of acids, sulfurs and nitrous oxide has been combined in one single compact instrument using one detection technology based on plasma emission (PlasmaDetek2). The MultiDetek2 compact GC has been configured with parallel channels to achieve the measurement at low ppb level for the different impurities. The sample collection can be performed with micro pump for ambient pressure application or bags, with a proportional micro valve for positive pressure application to control flow rate or with our auto injector headspace for vials. The MultiDetek2 was built using heated zones to avoid cold points between the columns and the plasma detector. The detector, valves, fittings and tubing are made of coated stainless steel to avoid surface adsorption. This ensures good sensitivity and repeatability measuring impurities.

LD15-03 Measurement of part per billion N2O in air

Application note LD15-03 (1,7 Mo)

With the global warming concerns, it is more and more critical to measure the nitrous oxide (N_2O) concentration in the ambient air. This application note will demonstrate how efficient the use of the PlasmaDetek-E is for the measurement of extremely low concentration of N_2O in ambient air without interference.

LD12-1 Greenhouse analysis with the PlasmaDetek

Application Note LD12-1 (807 Ko) The popularity to measure greenhouse gases (CH4, CO2 and N2O) has increased considerably in the last years with the global warming concerns. Chromatography is the well known technique to measure them and different detectors are used to achieve this task. This application note will explain how we can effectively do it with a simple gas chromatograph configuration involving the PlasmaDetek detector.

Industrial Gas

LD16-11 - Measurement of trace impurities in multiple bulk gases

Application note LD16-11 (2,97 Mo) Having an analytical system that is able to measure multiple impurities in different bulk gases is sometimes required. It is usually a big challenge to combine all the hardware in the same instrument.

LD16-10 - Measurement of trace Ar-Kr and N2 in a bulk gas Oxygen

Application note LD16-10 (1,12 Mo) Detecting and measuring trace Ar-Kr and N2 in a bulk gas Oxygen without the need of a cryogenic system, or a trapping adsorbent or an extra long column as generally used to measure trace ppb/ppm Argon as impurity from bulk Oxygen and for separating Krypton and Nitrogen.

LD16-09 - Measurement of trace impurities in UHP hydrogen

Application note LD16-09 (636 Ko) The production of UHP hydrogen requires analysis of trace impurities to control and certify the gas purity. Multiple instruments are usually dedicated to this task. Combining everything in the same instrument, the MultiDetek2 compact gas chromatograph is very efficient for this type of requirement. The detection down to part per billion can be achieved, what makes the instrument capable of certifying different hydrogen grades.

LD16-08 - Measurement of hydrocarbons in UHP Oxygen using the MultiDetek 2 and PlasmaDetek-E

Application note LD16-08 (1,68 Mo) This application note shows different methods that have been developed by LDetek for measuring the hydrocarbons in a stream of Oxygen (other matrixes can be analysed as well since the PlasmaDetek-E is strictly selective to hydrocarbons). This application note is the continuity of the application note LD16-02. It is then suggested to first read the LD16-02 to be advised about the technology that was used.

LD16-07 - Measurement of impurities in UHP Argon using the MultiDetek 2 and PlasmaDetek 2

AN-LD16-07 (709 ko) Argon is a widely used gas in different needs such as steel industries, air separation, welding, purging, chemical plants, semiconductor and others. Having a good analytical tool is mandatory to ensure the required purity of argon.

The most popular technique for UHP argon analysis is to detect trace impurities by gas chromatography. Some of the most common technologies will use a combination of multiple detectors to achieve the analysis requirements. Most commonly used are FID (flame ionization detector) combined with PDD (pulse discharge detector). This technique requires the need of helium as carrier gas what is an expensive gas to be used as carrier gas for the analysis of H2-N2-CO-CO2. The analyses of hydrocarbons will be performed using the FID what requires extra cost due to air and fuel. On top of that, the oxygen analysis must be performed using a separated trace oxygen analyzer due to the co elution of argon and oxygen in the gas chromatography system with helium ionization detection technique.

LD16-06 - LD8000 MultiGas online gas analysis solution for high purity compressed Helium used in cryogenic installations.

AN-LD16-06 (398 ko) Cryogenics is the branch of physics that deals with the production and effects of very low temperatures. Helium was a natural choice of coolant as its properties allow components to be kept cool over long distances. Super fluid helium has remarkable properties, including very high thermal conductivity; it is an efficient heat conductor. These qualities make helium an excellent refrigerant for cooling and stabilising the LHC's large-scale superconducting systems. The Large Hadron Collider (LHC) at institutions like the CERN in Switzerland is the largest cryogenic system in the world and one of the coldest places on Earth. It is one of the examples where the use of cryogenic Helium is essential for good working of the system.

LD16-02 - Analysis of hydrocarbons, CO2, N2O in Oxygen with the MultiDetek2 compact GC system using Nitrogen as carrier gas and the PlasmaDetek-E detection technology

Application note_LD16-02 (665 Ko) The hydrocarbon analysis for the production of high purity Oxygen on air separation plants is essential for safety of the operations and quality of the product. For a very long time, the flame ionisation detector has been used for detection of trace hydrocarbons in different gas mixtures. This detector has now many different designs all based on carbon ions collection. The FIDs require a mixture of Air and Hydrogen to generate the flame used for ionisation. It is also necessary to have extra safety based on Hydrogen gas handling. All these points result in increase of operating and start-up costs as demonstrated in Figure 1.

LD15-08 - Measurement of impurities in UHP helium using MultiDetek2 and PlasmaDetek2

Application Note LD15-08 (0,8 Mo)

Helium is a widely used gas in different needs such as cryogenics, pressurizing and purging, welding, controlled atmospheres, leak detection and breathing mixtures. Having a good analytical tool is mandatory to ensure the required purity of helium.

The most popular technique for UHP helium analysis is to detect impurities by gas chromatography. But some detection technologies within the GC do not provide the desired detection limit or can simply not measure some critical impurities like neon.

LD14-01 - Light hydrocarbons measurement with the *PlasmaDetek-E system with nitrogen carrier gas and the MultiDetek-2.

Application Note LD14-01 847 Ko

Hydrocarbons are ones of the most important impurities measured in the industry. Whether it is for safety, quality control, special gases or any other needs, those compounds are everywhere.

The techniques used to measure those compounds have been the same for quite some years. The FID (Flame Ionization Detector) is surely the most widely used in the industry. The selectivity for hydrocarbon (HC) gives the simplicity desired for all gas chromatograph (GC) users. However the need of air, but mostly hydrogen as fuel is the drawback of this technology. Many plants and laboratories would like to get rid of the hydrogen as potential explosive gas. All the safety feature (valves, extra lines, procedures, etc) are required an brings extra cost and manpower.

LD13-02 - Measurement of nitrogen in a mixture of Argon-Oxygen

Application Note LD13-02.pdf (2,7 Mo)

The measurement online of nitrogen in UHP argon is widely used and the LD8000 is now a reference in such measurement. However when measuring crude argon with a few % of oxygen, the conventional online instruments are not suitable anymore.

LD13-01 - Analysis of UHP Hydrogen production using Plasmadetek-2 & micro GC Multidetek-2

Application Note LD13-01.pdf (1.1 Mo)

The high purity hydrogen production demand is rising quickly and the need of measuring low ppb trace in a quick analysis run is then required. Most of the GC technologies available on the market use the same methods for years which required quite complex systems. Those systems require the use of different detectors to cover the application and a complex chromatograph configuration what make the price of such system increasing. The complexity of the chromatograph operations, the long analysis time and the limitations to achieve low ppb measurement are often faced.

LD8000 Trace Nitrogen in Argon or Helium analyzer - DESIGN REPORT

Design Report (2,6 Mo)

The need of trace nitrogen in argon or helium analysis in the industry is not something new. Many instruments have been and still are on the market to achieve such measurement for different type of applications. The most popular use is without any doubt in air separation industry for the production of argon.

The demand and the production of gas more and more pure require good analytical instrumentations. It is even more the case for the measurement of nitrogen. Small leakage, dead volume, change in temperature, bad accuracy, etc can all cause big headaches.

In this document, information about the design of the LDetek LD8000 trace nitrogen in argon or helium analyzer will be described to explain how we achieve such good performance. Those results are also described to show that the LD8000 is now the solution for any applications that require such measurement.

LD12-9 Hydrocarbons measurement for Oxygen production using PlasmaDetek & Multidetek-2

Application Note LD12-9 (2,8 Mo)

Oxygen is one of the basic chemical elements. In its most common form, oxygen is a colorless gas found in air. It is one of the life-sustaining elements on Earth and is needed by all animals. Oxygen is also used in many industrial, commercial, medical, and scientific applications. It is used in blast furnaces to make steel, and is an important component in the production of many synthetic chemicals, including ammonia, alcohols, and various plastics. Oxygen and acetylene are combusted together to provide the very high temperatures needed for welding and metal cutting.

The most common commercial method for producing oxygen is the separation of air using either a cryogenic distillation process or a vacuum swing adsorption process. Nitrogen and argon are also produced by separating them from air. The figure 1 represents a common cryogenic distillation process for producing oxygen.

LD12-7 Analysis of Neon-Hydrogen-Argon-Krypton-Nitrogen with the PlasmaDetek & the HSR-Etek column

Application Note LD12-7 (819 Ko) The analysis of Neon, Hydrogen, Argon, Krypton and Nitrogen by chromatography has always been problematic. The bad separation and the poor sensitivity for the analysis of these impurities are the reasons that make it complicated to realize. Even with the use of capillary columns, cryogenic system and/or hydrogen trapping system, the analysis of low ppb of these impurities cannot be performed in one run. Furthermore, the detectors available in the industry have some sensitivity limitation. It is then very difficult to measure low ppb for the mentioned impurities especially for Neon with the existing technologies.

LD12-6 Increasing argon production with the MultiDetek

Application Note LD12-6 (438 Ko)

Air is composed of nitrogen (78.09%), oxygen (20.94%) and argon (0.934%). To produce pure argon, distillation process separates the air constituent by the use of distillation columns. Such installation on an air separation plant is used for many years.

This separation process is based on vapor pressure of each component. Argon is taken from a low pressure column and introduced in a second column called crude argon. Since argon vapor pressure is close to oxygen, and also between nitrogen and oxygen, its extraction is between those two other components in the low pressure column before being introduced in the second column.

LD12-4 Analysis of nitrogen in hydrogen and oxygen bulk with the PlasmaDetek

Application Note LD12-4 (1,4 Mo)

Measuring nitrogen as impurity in low concentration is not an easy task. It is mostly the case in hydrogen and oxygen background. Even if the chromatography system is quite efficient, the remaining bulk gas could influence the reading of nitrogen.

The PlasmaDetek, configured to be selective on nitrogen, brings very good result for this measurement. This document will demonstrate how this technology can help to make better analysis on nitrogen with any gas chromatograph system.

LD12-3 Analysis of argon in pure oxygen with the PlasmaDetek and ArgoTek

Application Note LD12-3 (565 Ko)

The complexity of measuring argon as impurity in chromatography comes from the fact that typical columns on the market do not separate argon and oxygen. Both elute at the same time making the analysis difficult in low concentration. There are typical techniques for this measurement:

- Using an oxygen trap which involves regeneration procedure with H_2 supply, maintenance, consumable and complex chromatography system.
- Cryogenic configuration where columns need to be used in cold environment which involves complex manipulation.
- Using an online oxygen analyzer in parallel and substract the oxygen from the measurement of $Ar+O_2$. But this requires a second analyzer and it is difficult to get an accurate measurement in low concentration.

But the combination of the PlasmaDetek and the ArgoTek column is the ideal solution to measure argon in ppt to %.

LD12-2 Analysis of permanent gases and light hydrocarbons with the PlasmaDetek

Application Note LD12-2 (328 Ko) The PlamaDetek is ideal to measure permanent gases and light hydrocarbons in different matrices. Only one detector system is needed to accomplish this task. Such measurement is required in many different applications field: industrial, petrochemical, energy, environmental, etc. The sensitivity, the stability, the ease of start-up and installation make this system very attractive for any users.

Petrochemical

LD17-01 - Trace Hydrocarbons and Permanent gases in Propylene

AN-LD17-01.pdf (0,92 Mo)

The high purity Propylene is used for the production of Polypropylene in Petrochemical industry. The analysis of trace impurities is critical to ensure a good quality of the final product. The analysis of hydrocarbons and permanent gases are required at a level below 10ppm to ensure the good operation of the production process.

LD16-05 - Refinery gas analyses with MultiDetek2 compact gas chromatograph and PlasmaDetek2 gas detector

AN_LD16-05 (916 ko) The analysis of trace permanent gases has many different fields of application in the petrochemical industry. One of the most important is for controlling the manufacturing process and the product quality. For example, some contaminants as carbon monoxide and carbon dioxide tend to deteriorate the catalysts in the propylene and ethylene polymer grade production.

LD13-03 - Measurement of H_2S and COS in Syngas with MultiDetek 2

Application Note LD13-03.pdf (1,5 Mo)

Singas (Synthesis gas) a fuel gas mixture, primarily composed of hydrogen, carbon monoxide and carbon dioxide,
is mainly used as intermediate in creating synthetic natural gas (SNG) or ammonia or methanol.

To be able to use a clean and environmental friendly fuel and feedstock, the sulfurs compounds must be removed.
Right analysis tool is needed to ensure that the concentration of sulfurs is kept at the minimum desired level.

LD12-8 Analysis of Sulfurs with the PlasmaDetek

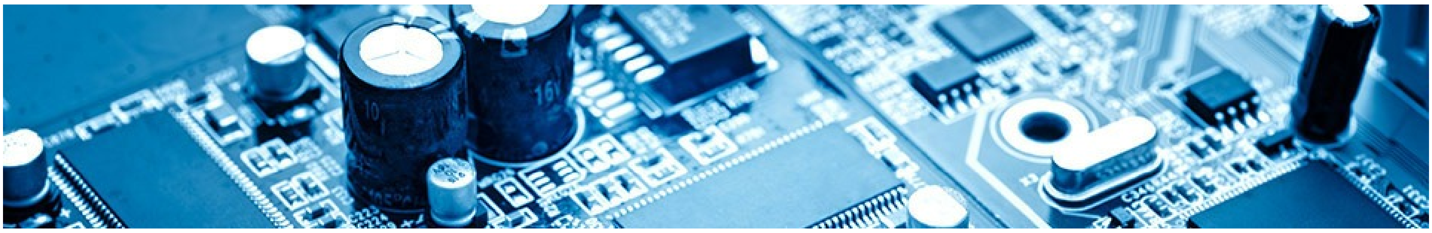
Application Note LD12-8 (1,1 Mo) The analysis of sulfurs can now be performed using the PlasmaDetek technology. With its sulfurs selective mode, the analysis of low ppb sulfurs can be easily quantified.

Agriculture

LD15-01 - Measurement of hydrocarbons, including the organic hormone (Ethylene) in CO2 production with MultiDetek-2 and PlasmaDetek-E

Application note LD15-01 (1,6 Mo)

A Greenhouse CO2 environment is commonly used for the production of organics like fruits, plants and flowers. In this case, the production and control of the CO2 gas purity are critical to ensure the proper growth of the organics.



Electronic gases & semiconductor

LD16-03 - Measurement of part per billion H2-NMHC-CH4-N2-CO2-CO for semiconductor gases

Application note_LD16-03 (1,66 Mo)

Using the PlasmaDetek2 (PED) and the MultiDetek2 (GC), analyses of part per billion below 1ppb level become feasible all in one chassis. The analyses of the impurities H2-Ar-N2-CH4-CO-CO2-NMHC at concentration going down to single-digit ppb can be performed in multiple gas backgrounds. This application note will show the results obtained with a MultiDetek2 GC system having multiple configurations.

The MultiDetek2 system detection technology is based on the enhanced plasma emission detector (PlasmaDetek2). The specific configuration of the plasma detector that was used, allows a selective and sensitive detection of the desired impurities and blocks the undesired interference gases. Last years long-term work on the new patented plasma technology used for low ppb detection gives the ability to detect single-digit ppb down to 0.100ppb. It offers the capacity of measuring the complete gas matrix that appears on chart 1, all in one compact industrial GC chassis without the use of any traps as commonly installed by other GC manufacturers.

This document demonstrates the performances of the system by offering chromatograms, charts and graphs all obtained at low ppb concentration to show the real peak shapes and results. For more details about trace ppb Ar-N2 as impurity, please refer to the application note LD15-02 that gives additional information.

LD15-04 - Measurement of silane purity in electronic gases industry

Application Note LD15-04 (1,8 Mo) Silane (SiH_4), more properly known as monosilane and alternately called silicon tetrahydride or silicane, is a highly flammable and hazardous chemical compound containing silicon (87.45%) and hydrogen (12.55%). With silicon comprising 87.45% of its content by weight, pure silane is a primary source of high-purity silicon for use in industry. It is a critical gas in the manufacture of semiconductor devices, display panels and other electronic devices. The analysis of ultra low part per billion of permanent gases in silane is required for measuring the silane purity. The use of the LDetek compact & industrial MultiDetek2 GC combined with the PlasmaDetek-E is the perfect fit for this domain of application.

LD15-02 - Measurement of part per billion Ar and N2 in oxygen for semiconductor industry

Application note LD15-02 (1,5 Mo)

The oxygen pipeline purity that goes to the semiconductor industry must be properly measured to ensure that there is no contaminant in it. It is critical and challenging to measure the ppb content of argon and nitrogen impurities in oxygen. The conventional technique used for such application is with a heated Oxy-Trap system combined with HID or conventional PED. Such technique requires a complex chromatography system with periodic Oxy-Trap regeneration with hydrogen. The operations of such system require a lot of maintenance and specialist interventions on a routine basis.

Natural Gas

LD15-09 - Measurement of THT in natural gas using MultiDetek2 and PlasmaDetek2

Application note_LD15-09 (1,38 mo)

A quick analysis to trace tetrahydrothiophene (THT) in natural gas is required for controlling the amount of this odorant added in the natural gas. Due to its odor, the THT is used to detect any presence of gas leakage in natural gas distribution networks. The THT is composed of a five-membered ring containing four carbon atoms and a sulfur atom. It is also known as thiophane or thiolane. The THT is generally used in mixtures containing tert-Butylthiol (TBM) which is an organosulfur compound with the formula (CH3)3CSH. In the presence of TBM in natural gas, it is required to measure its concentration at low ppb/ppm because of its strong odor that causes nausea. The permissible exposure limit (PEL) is in the range of 500ppb and it is the reason why a highly sensitive detection system is required for measuring both THT and TBM in natural gas.

Energy

LD16-04 - Sulfur Hexafluoride (SF6) purity analysis using the MultiDetek 2 and PlasmaDetek 2

AN-LD16-04 (496 ko) SF6 is used in the electrical industry as a gaseous dielectric medium for high-voltage circuit breakers, switchgear and other electrical equipment. Due to its high electrical insulation properties, it is often used for replacing oil filled circuit breakers. The sulfur hexafluoride is an expensive gas and it also has been identified as the most potent greenhouse gas. A SF6 purity monitoring instrument is then required in the electrical industry to prevent failures, extend equipment life, reduces equipment cost and increase safety.

Food and Beverage

LD17-02 - Gas analysis for wineries

application_note_LD17-02 (1142 Ko) In the wineries for proper wine production, inert gases like nitrogen, carbon dioxide and argon are used for sparging, blanketing as counter-pressure to move wine(usually from barrels), as well as to flush transfer lines and tanks prior to moving wine or juice. Sparging involves the introduction of a stream of very fine gas bubbles to help add or remove dissolved Oxygen or CO2. Blanketing partially-filled tanks attempts to maintain an inert gas layer above the wine/juice surface in the hope of minimizing wine/air contact. The main reason for the use of inert gassing is to prevent the growth of aerobic microorganisms in the wine. The gas chromatography is a well known analysis technique to ensure the measurement of the purity and to control the production of wine to achieve the best quality.

LD16-12 - trace impurities in Carbon Dioxide for beverage and food packaging industry

Application note LD16-12 (2,10 Mo)

With regards to the beverage industry, the dissolved Carbon Dioxide which is used as carbonic acid gives a pleasantly acidic fl avour and a nice mouth-feel when drinking. When it is not present, the drinks taste fl at. Being used in many different fi elds of food and beverage, the CO2 quality management is essential to meet the market requirements.

The CO_2 is produced from different techniques such as fermentation, combustion, ammonia/hydrogen production and others. It is required by the industry, especially for bottlers to control the supply chain by monitoring the CO_2 purity allowing maintenance of the product quality.

Our other fields of applications

Pharmaceutical and Medecine

Hydrocarbons processing

Health and Safety

- OUR PRODUCTS
  - PLASMADETEK
  - MULTIDETEK 2
  - LD8000
  - LDP1000
  - PLASMADETEK 2
  - LabDetek
  - LD8000+
  - TRAPS AND ACCESSORIES
  - PLASMADETEK 3
  - LDGSS
  - LD8000 MultiGas
  - LD2000
  - LDGDS
- APPLICATIONS
  - Applications notes
  - Chromatograms