DVLS^3 Simply, Smart Sensor

Safely Detect Hydrogen leaks in Gas Chromatography Systems

Eliminate the risks associated with the use of 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 N_2), 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.

Hydrogen the De Facto Choice for GC Laboratories

To underscore the status of hydrogen as the de facto carrier gas of choice, ASTM subcommittee DO.2O4 for Hydrocarbon Analysis strongly recommends developing new methods with hydrogen.

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 placing laboratories and their personnel at risk.

Boosting Laboratory Efficiency

New DVLS³ Simply, Smart H_2 Sensor

Safely Detect Hydrogen leaks in Gas Chromatography Systems

The ability to safely detect hydrogen leaks in the GC oven is critical to any laboratory using hydrogen as a carrier gas. The new DVLS³ H_2 Sensor ensures the safe use of hydrogen in GC analysis. It does this by constantly monitoring the H_2 concentrations in the GC oven and automatically switching to an inert gas when typically 25% LEL is reached; this important feature eliminates the risks and at the same time ensures safety.

DVLS³ Sensor Features

- Explosion risk eliminated
- Lower operating costs
- Optical and acoustic alarms
- Automatic alarm activation
- Automatic carrier gas switching from H_2 to N_2
- Automatic stop signal sent to the GC
- Easy Calibration
- Easy to Install
- Compatible with all GC's
- Leak Detection indicates analysis is compromised
- Multi-sensorcapability, supports up to 4 sensors:
  - Hydrogen Leak Detection
  - Temperature
  - Pressure
  - Level

Who benefits from using the DVLS³ Simply, Smart H_2 Sensor?

All GC and online GC's using hydrogen as a carrier gas.

Mode of Operation

DVLS³ is installed in the GC oven for continuous monitoring of H_2 concentrations in the oven air. The measured gas concentration shown on the LCD screen of the external controller.
When the hydrogen concentration reaches the user defined level, typically between 25% and 50% LEL (equal to 1%-2% by Vol H_2), the LCD screen starts flashing, an acoustic signal is transmitted and the carrier gas will automatically be switched to an inert gas.

Technical Specifications

- Multiple Sensors: Max 4 sensors individually controlled
- Gas Sensor integrated in GC oven, carrier gas switch and LCD display are in an external controller
- Catalytic Pellistor gas sensor, linear range of 0-2% H_2 (0-50% LEL)
- Detection range : 0-50% LEL (0 - 2,0% by vol.H_2)
- User defined alarm level optical and/or acoustic alarm up to 50% LEL
- Instrument readings: provide real time sensor readings with alarm levels, channel states
- Dimensions: 11 cm (W), 14 cm (D), 5.5 cm (H)
- User menu for configuration (password protected)
- Valve : High pressure 3 way solenoid valve
- Oven operating temperature: up to 450°C
- 24VDC power adapter

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