



White paper.

Helium shortage:
convert to Hydrogen!

R Evolution
in Gas Generators
and Calibrators



HELIUM IS RARE...

HAVE YOU THOUGHT ABOUT
LNI HYDROGEN GENERATORS
FOR YOUR GC LAB?

R Evolution
in Gas Generators
and Calibrators



HELIUM...

Helium and GC / GCMS.

Helium is rare.

Rare means expensive

Helium has been the preferred carrier gas for GC and GC/MS for a long time. Helium has excellent chromatographic and MS performance.

Although Helium is the second most abundant element in the Universe, it is becoming rare on earth.

Shortages of the recent years have caused unpredictability for gas chromatographers prompting them to look for an alternative.

Difficulties with the availability of helium have created a continuous price increase. And helium's forecast for the years to come sees the price rising.



According to the www.cryptopolitan.com website, price of Helium could reach \$46.70 on January 2023.

HYDROGEN...

Hydrogen and GC / GCMS.

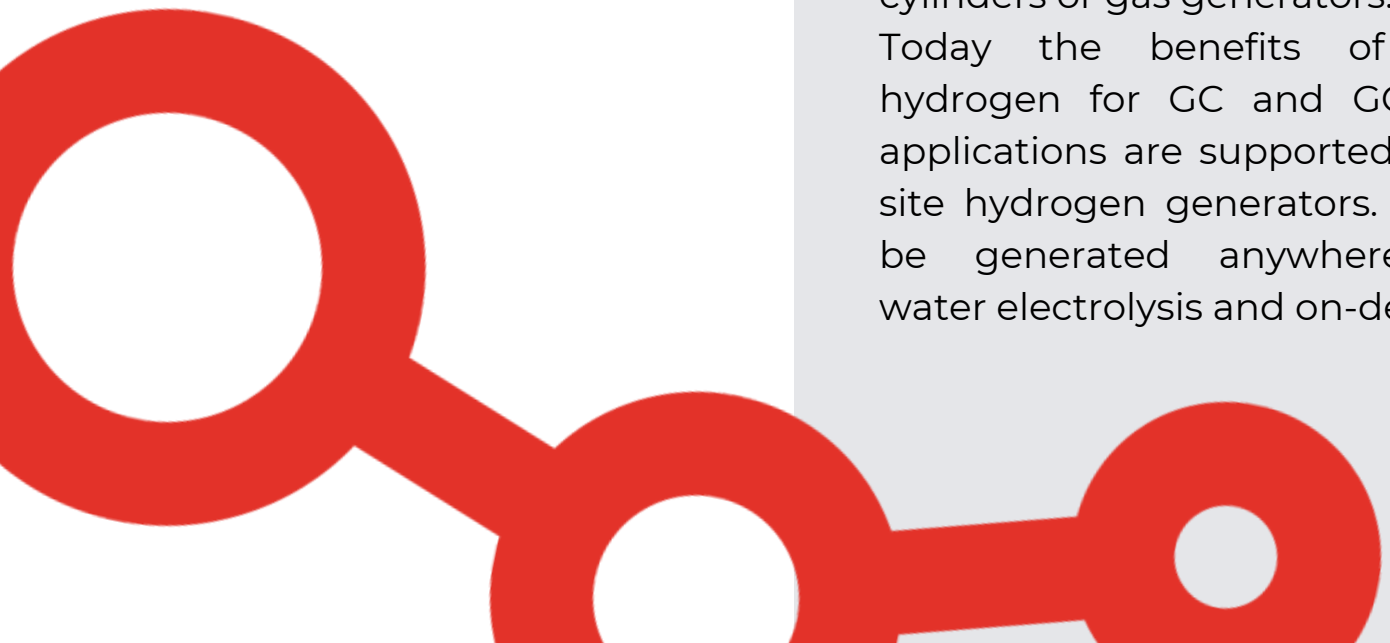
Hydrogen is considered as the best alternative for GC and GC/MS. It has better performance (better chromatographic resolution and speed of analysis) compared to other gases such as Argon or Nitrogen.

Ready to convert?

Practitioners looking to switch to Hydrogen can obtain numerous guides and software packages to facilitate the process and speed up the transition.

Cylinders or gas generators?

Two main sources of Hydrogen are available: high pressure gas cylinders or gas generators. Today the benefits of using hydrogen for GC and GC / MS applications are supported by on-site hydrogen generators. H₂ can be generated anywhere with water electrolysis and on-demand.



H2 GAS GENERATORS.

Today, a lot of laboratories worldwide still use gas cylinders to supply their analytical instruments, But gas generators are the best alternatives to gas cylinders.

What is a hydrogen gas generator?

A hydrogen generator is a system that produces on-demand hydrogen to supply analytical instruments. They are used in many laboratories for analytical purpose.

How does it work?

A gas generator produces hydrogen gas from distilled. Economical, green and safe alternative to high pressure gas cylinders.

LNI have been manufacturing premium hydrogen generators for many labs throughout the world for more than 30 years offering a safer, greener, more convenient and cost effective alternative to cylinders.



H2 GAS GENERATORS ARE CONVENIENT.

Gas cylinders (H2 or He) may seem to be cheaper but when comparing the yearly expenses with the one of a hydrogen generator, gas generators clearly appear to be more convenient than gas cylinders.

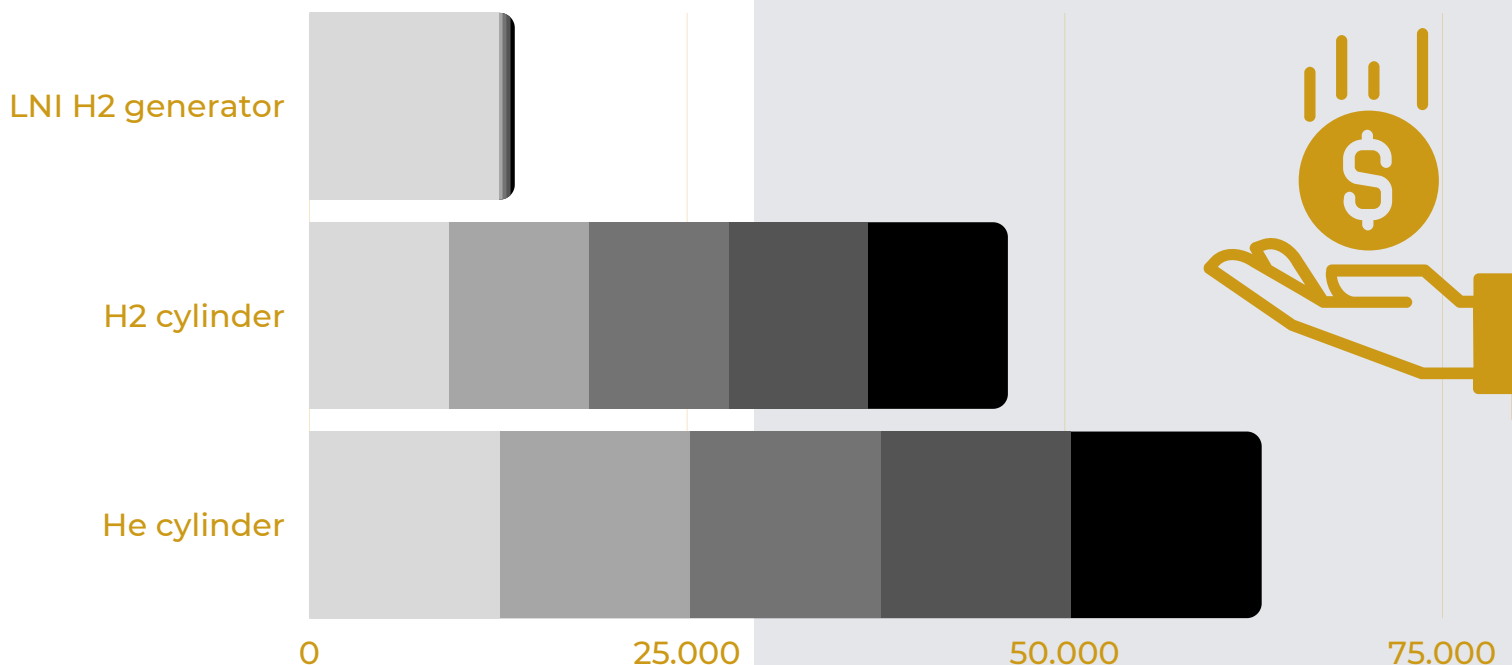


A gas generator from LNI has a higher longevity when compared to competing systems.

Let's compare considering :

- 5 years time
- Helium cylinder cost
250€ each
- Hydrogen cylinder cost
180€ each
- cylinder rental and delivery
20€ per cylinder per month
- A hydrogen generator
1100cc/min cost
12500€ each
- 4 cylinders consumption/ month

ROI appears clearly from year 2.
A H2 generator is an investment , it has a higher cost at the purchase but results cheaper at the end of the second year already.



H2 GAS GENERATORS ARE SAFE.

Safety in a lab is paramount and on-site hydrogen generation is much safer than gas cylinders storage.

On-demand production of gas.

No risk of leaks.

On-board CPU to check.



In case of worries with Hydrogen as a carrier gas, LNI supplies on request hydrogen sensors.

A hydrogen generator produces on-demand hydrogen at a controlled level and at low pressure. It does not store any hydrogen inside itself.

No storage, no leaks. In the unlikely event of a leak, only a very small quantity of hydrogen is released without any explosion risks.

LNI H2 gas generators have on-board CPU that automatically check for internal leaks and constantly control the operating parameters to guarantee full safety.



H2 GAS GENERATORS ARE GREEN.

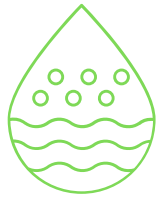
On-site gas generators are definitely a green choice.

Carbon footprint.



LNI gas generators have the smallest carbon footprint in the market. One generator replaces thousands of hazardous gas cylinders and their deliveries.

Resources.



On-site hydrogen generation uses renewable resources: air and water.

Energy-savings features.



Our products are energy-efficient. They utilize technology with energy savings features that can reduce up to 30% of energy consumption when comparing to other gas generators.

Green technology.



The remote diagnostics capability on our products helps us to support our customers quickly while avoiding travel, whenever possible, and the environmental impact it imposes on our planet.



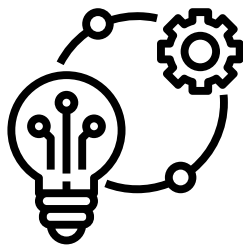
You can save up to 30% of energy costs with a LNI gas generator.

LNI H2 GAS GENERATORS.

LNI premium hydrogen gas generators have been developed for laboratories and especially for gas chromatography (GC) and gas chromatography-mass spectrometry (GC-MS) applications: Fuel Gas, Carrier gas, Combustion Gas, Make-up gas and others.

LNI combines expertise and innovation to provide reliability and sustainability for your analytical lab.

The best technology.



LNI Swissgas hydrogen generators have very unique innovative features when compared to others.

The most powerful.



LNI gas generators are equipped with patented, cutting edge technology, which meet the GC requirements for all major instrument OEMs. Equipped with Proton Exchange Membrane (PEM) technology.

LNI H2 generators are the smallest and most powerful in the market with flow-rates from 100 cc/min to 4000 cc/min and pressure up to 16 bars with very high purity.

LNI H2 GAS GENERATORS

Discover...

HG PRO

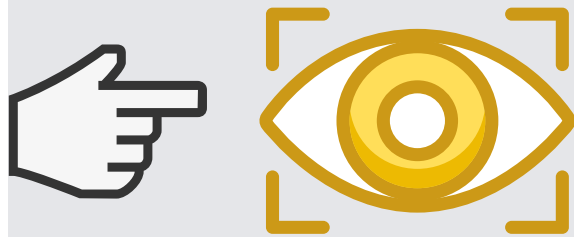
Hydrogen generator.



Product focus

The HydroGen series HG PRO is able to generate up to 1500 cc/min of Hydrogen with purity better than 99.99999% and pressure up to 16 bar (232 psi).

More:



Success story

Read our success story about HG PRO product:



R Evolution in Gas Generators and Calibrators

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