TRACE GAS ANALYZER (TGA)

Process Rack 19”
MINI GC

Analysis of Impurities in Gases, customizable with FID, PDHID, ECD or TCD

SRA INSTRUMENTS
ANALYTICAL SOLUTIONS

TRACE GASES

Hydrogen and other high purity gases are essential for many industrial and scientific applications, especially for fuel cells, semiconductor manufacturing and advanced chemical processes. The presence of impurities even at parts per billion (ppb) levels can compromise the efficiency and safety of systems.

The **VICI Trace Gas Analyzer (TGA) is the first 19” Rack process MiniGC** designed for online analysis of impurities in Hydrogen and other gas matrices, with detection limits below 50 ppb.

Why choose the TGA?

- **Continuous monitoring** of He, H_2, N_2, Ar, O_2, BF_3, CO, CO_2, CH_4, C_2H_4, C_3H_6, CF_4, C_2F_6, C_3F_8, NF_3, HBr, AsH_3, PH_3, B_2H_6, SiF_4 and SiH_4.
- **Detectability down to 50 ppb** for advanced quality control.
- **Compliant with ISO 14687:2019**, the reference standard for Hydrogen in fuel cells.
- **Available in two versions:**
  - **Classic TGA** up to 2 detectors.
  - **Extended TGA** up to 4 detectors, for even more complete multi-compound analysis.
- **19” Rack design**, designed for integration in industrial plants and laboratories.

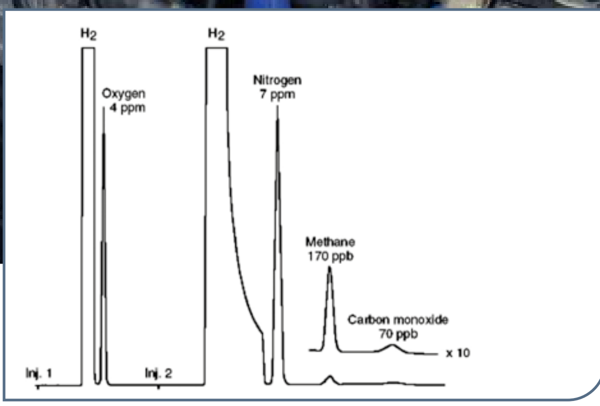
ADVANCED TECHNOLOGY AND PERFORMANCE

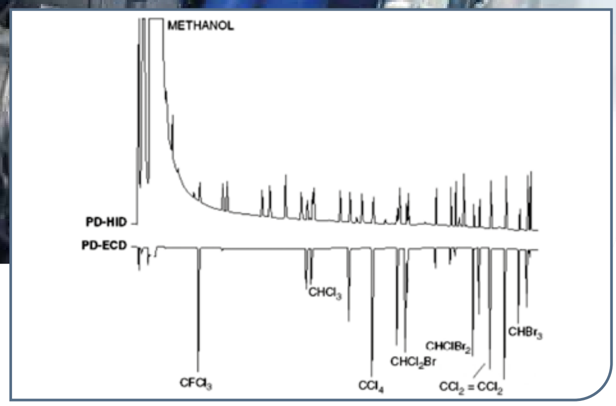
Available Detectors

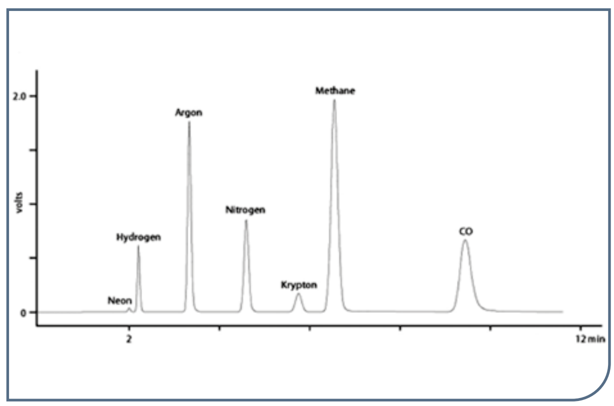
The TGA can be configured with the following detectors:

- **PDHID (Pulsed Discharge Helium Ionization Detector)**
  Sensitive to noble gases, hydrocarbons, sulfur compounds and CO_2.
- **FID (Flame Ionization Detector) with methanizer**
  Analyzes CO and CO_2 by converting them to CH_4 for ultra-sensitive detection.
- **TCD (Thermal Conductivity Detector)**
  Versatile, ideal for analyzing a wide range of concentrations.
- **ECD (Electron Capture Detector)**
  Selective for halides, chlorinated and fluorinated compounds.

ANALYTICAL DETAIL AND CHROMATOGRAMS







Performance Characteristics

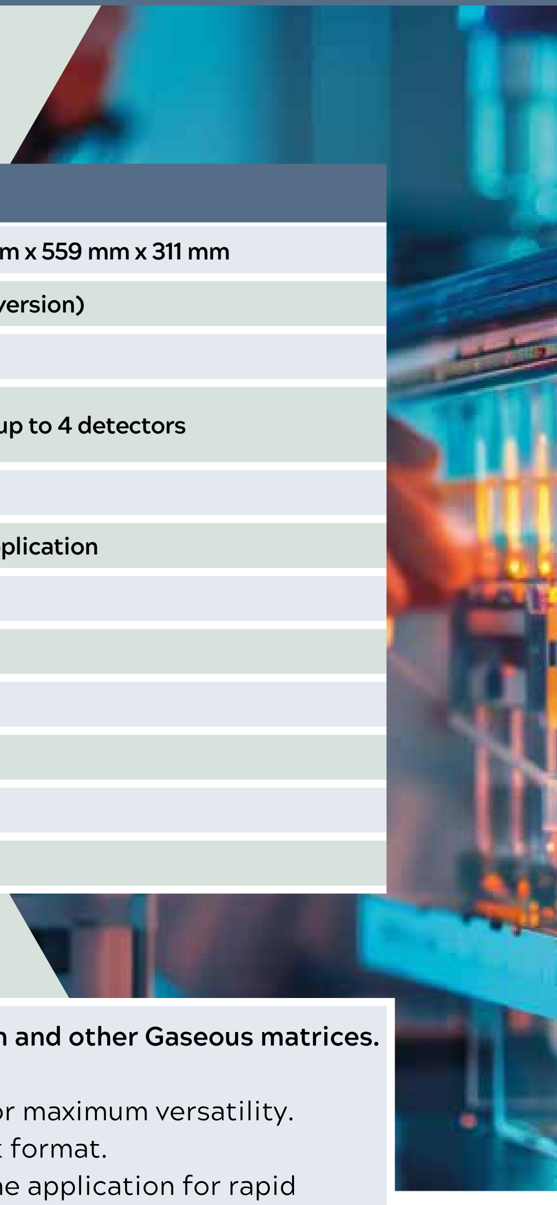
- **Detection limit**
  <50 ppb for the most critical impurities.
- **Analysis time between 90 and 300 seconds depending on the application**
  For rapid and continuous monitoring.
- **Programmed Temperatures up to 3000°C/m**
  In Fast Analysis mode.
- **Flexible configuration**
  - **Classic TGA**
    > up to 2 detectors.
  - **Extended TGA**
    > up to 4 detectors, for an even more complete analysis.
- **Automation and Connectivity**
- **Integrated PLC**
  For remote management via LAN, WiFi, MODBUS RTU/TCP, RS485, 4-20 mA.

INDUSTRIAL APPLICATIONS

The TGA is designed for quality control in critical environments, including:

- **Hydrogen and Fuel Cell Industry**
  - H_2 quality control according to **ISO 14687:2019**.
  - Monitoring of impurities harmful to fuel cells: He, H_2, N_2, Ar, O_2, BF_3, CO, CO_2, CH_4, C_2H_4, C_3H_6, CF_4, C_2F_6, C_3F_8, NF_3, HBr, AsH_3, PH_3, B_2H_6, SiF_4, and SiH_4.
  - Verification of Hydrogen purity in production, transportation and storage processes.
- **Energy and Power-to-Gas**
  - Quality control of Hydrogen produced by electrolysers and reformers.
  - Analysis of impurities in power-to-gas and power-to-liquid systems.
- **Industrial Gases and Semiconductor Industry**
  - Purity control of technical gases such as H_2, N_2, O_2, Ar, He.
  - Monitoring of contamination in ultra-pure gases for the electronics industry.
- **H_2 Refueling Stations and Automotive**
  - Monitoring of the quality of Hydrogen for fuel cells in electric vehicles.
  - Verification of the required standards for Grade D/E Hydrogen.

TECHNICAL SPECIFICATIONS



Parameters	Value / Description
Format	19” rack - 432 mm x 597 mm x 178 mm or 432 mm x 559 mm x 311 mm
Weight	13.6 kg (compact version) - 20.4 kg (extended version)
Available Detectors	PDHID, FID or FID Methanizer, TCD, ECD
Available Configurations	TGA Classic: up to 2 detectors TGA Extended: up to 4 detectors
Detection Limit	< 50 ppb
Analysis Time	Between 90 and 300 seconds depending on application
Carrier Gas	Purified helium, regulated at 5.5 bar
Carrier Gas Flow	<30 ml/m per detector
Actuator Gas	Instrument air, regulated at 4.1 bar
Power Supply	100-120 V or 220-240 V, 50/60 Hz
Communication Interfaces	MODBUS RTU/TCP, RS485, 4-20 mA, LAN
Regulatory Compliance	ISO 14687:2019 for Hydrogen quality

COMPETITIVE ADVANTAGES

- **The first MiniGC for the analysis of trace impurities in Hydrogen and other Gaseous matrices.**
- High Sensitivity, with a limit of quantification up to **50 ppb**.
- Available in two versions, with support for up to 4 detectors for maximum versatility.
- Easy integration into industrial systems thanks to the 19” Rack format.
- Response times between 90 and 300 seconds depending on the application for rapid operational decisions.
- Compliance with **ISO 14687:2019**, perfect for fuel cell and Hydrogen applications.

CONCLUSIONS

The VICI Trace Gas Analyzer (TGA) is the ideal solution for the ultra-sensitive monitoring of impurities in Hydrogen and ultra-pure gases.

Contact us for a demonstration or a personalized quote!

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Agilent Technologies
Premier Solution Partner

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*This information is subject to change without notice.

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