Agilent 490 Micro GC Natural Gas Analyzers

Data Sheet

Key benefits

- **Complete solution.**
  The Agilent 490 Micro GC Natural Gas Analyzers are shipped as a total solution. The analyzers are factory tuned and come with final test data, analytical method parameters, analyzer user manual, and a check-out sample. Software for calorific value/BTU calculations is available as an option.
- **Optimized configuration.**
  The Natural Gas Analyzers provide the results and ruggedness you demand in the laboratory or in the field for the analysis of natural gas and related sample streams. Agilent provides multiple Natural Gas Analyzer solutions depending on the composition of your natural gas and the compounds of interest.
- **Ready-to-go.**
  Start-up is easy; the analyzer ships fully loaded with a method and is ready-to-go upon installation.
- **Easy to operate.**
  The Agilent 490 Micro GC is designed to achieve the best possible results. This system does not require a high degree of operator skills to be used successfully.
- **The speed you need.**
  Micro GC is all about fast chromatography. Precise gas analysis in seconds rather than minutes provides improved product quality and more exact product valuation.
- **Fast delivery.**
  The Agilent Natural Gas Analyzers are shipped from stock, ensuring short delivery times.

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Introduction

Natural gas is bought and sold as a bulk commodity with a price based on its energy content. It is very important for all stakeholders in the natural gas supply and consumer chain to accurately determine the composition and heating value of their streams. That is where the Agilent 490 micro GC based Natural Gas Analyzers can play a significant role.

Natural gas mainly consists of methane and variable levels of other hydrocarbons and permanent gases such as nitrogen and carbon dioxide. Different sources of natural gas usually have similar composition but vary in concentration.

Gas chromatography offers a proven technology to determine the composition and energy content of natural gas in a cost effective way. Based on the 490 Micro GC, Agilent offers a full range of solutions for the analysis of natural gas. The 490 Micro GC can be equipped with one to four independent column channels. Each column channel is a complete, miniaturized GC with electronic carrier gas control, a micro-machined injector, a narrow-bore analytical column, and a micro-thermal conductivity detector (μTCD).

Choose the right Natural Gas Analyzer for your needs

Depending on the composition of the natural gas and the components of interest, Agilent has four 490 Micro GC based Natural Gas Analyzer configurations available. An overview of the hardware and analysis characteristics is given in the technical specification table, on the next page.

Agilent 490 Micro GC based Natural Gas Analyzers are equipped with heated sample lines and injectors to eliminate any cold spot and prevent possible condensation of moisture, to ensure the integrity of the sample is maintained throughout the sample flow path.

When necessary, the column channels are equipped with backflush to vent functionality. For the molecular sieve column, this backflush to vent is required to maintain the separation efficiency. Moisture and carbon dioxide tend to adsorb quickly to its stationary phase changing the chromatographic properties, which can result in retention shifts and loss of separation. The backflush functionality for the other channels are used to backflush higher hydrocarbons to vent, preventing these late eluting components from interfering in the next analysis.

The CP-Molsieve 5A channel is equipped with the retention time stability (RTS) option. This RTS option consists of additional in-line filters between the electronic gas control and the column module to ensure moisture and carbon dioxide free carrier gas. Using the RTS option enables a more efficient backflush of carbon dioxide. This enhances column lifetime and, most importantly, leads to more stable retention times.

For the analysis of hydrogen sulfide, the stainless steel tubing and connectors in the PoraPLOT U column and Micro GC sample inlet have an UltiMetal deactivation layer resulting in an inert sample flow path for excellent peak shape and lower detection limits. For more analysis details and a chromatogram for each column channel see the Natural Gas Analyzer application note [1].

Technical specification

Analyzer characteristics	Natural Gas A Analyzer	Natural Gas A Analyzer Extended	Natural Gas B Analyzer	Natural Gas B Analyzer Extended
Hardware				
Micro GC cabinet type	Dual	Quad	Dual	Quad
Number of column channels	2	3	2	3
HayeSep A column channel 40 cm, with backflush	–	✓	–	–
HayeSep A column channel 40 cm, without backflush	✓	–	–	–
PoraPLOT U column channel 10 m, with backflush	–	–	✓	✓
CP-MolSieve 5A column channel 10 m, with backflush and retention time stability (RTS)	–	–	–	✓
CP-Sil 5 CB column channel 6 m, without backflush	✓	–	✓	✓
CP-Sil 5 CB column channel 4 m, with backflush	–	✓	–	–
CP-Sil 5 CB column channel 8 m, without backflush	–	✓	–	–
All channels equipped with heated injectors (up to 110 °C)	✓	✓	✓	✓
Dual carrier gas connection[1]	–	–	–	✓
Sample inlet UltiMetal treated, for analysis of hydrogen sulfide	–	–	✓	✓
Heated sample line (up to 110 °C)	✓	✓	✓	✓
Analysis characteristics				
C1 to C9 hydrocarbon analysis	✓	✓	✓	✓
C1 to C12 hydrocarbon analysis	–	✓	–	–
Carbon dioxide analysis	✓	✓	✓	✓
Methane and composite air separation	✓	✓	✓	✓
Hydrogen sulfide analysis (max 5%)	–	–	✓	✓
Oxygen and nitrogen separation	–	–	–	✓
Helium and hydrogen analysis[1]	–	–	–	✓
Miscellaneous				
Sample type	Natural Gas, Liquefied Natural Gas and related streams[2]			
Sample introduction	Internal sample pump or continuous flow; ambient pressure to 68 bar/1000 psi[2]			
Repeatability (RSD%)[3]	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Typical analysis time	100 s (until C7) 400 s (until C9)	100 s (until C10) 240 s (until C12)	75 s (until C6) 400 s (until C9)	75 s (until C6) 400 s (until C9)

[1]: The CP-Molsieve 5A column channel is separated from the other channels; all channels are set to helium. When the analysis of helium and hydrogen is required, the carrier gas must be changed to argon.

[2]: To introduce a Liquified Natural Gas (LNG) or pressurized sample (above 1 bar/14,5 psi) on the Micro GC, the use of the Micro-Gasifier is required.

[3]: For propane at 1 mol % level on WCOT column at constant temperature and pressure.

Calorific value determination

To determine the commercial value of the natural gas it is crucial to calculate its heating value and some other related parameters. These key parameters, calculated by the optional EZReporter software, are available as a printed report, an export file for connection to a laboratory information management system (LIMS), for monitoring including lower and upper warning limits, and for trend plotting. An overview for compatibility and official methods supported in EZReporter is shown in the table below.

Product description	Compatible with	Supported standards
EZReporter for calorific value/BTU calculations	Agilent EZChrom 3.3.2., Agilent OpenLAB CDS EZChrom Edition, and Agilent OpenLAB CDS ChemStation Edition	GPA 2172-09 ASTM D 3588-98 (2003) ISO 6976 (1995)

Accessories

The table below gives an overview of the most important Agilent 490 Micro GC Natural Gas Analyzer compatible accessories. Contact your local Agilent office for more details and other accessories.

Product description	Compatible with	Part number
Portable field case For dual channel cabinet and single carrier gas	Natural Gas Analyzer A and Natural Gas Analyzer B	CP490240
Portable field case For quad channel cabinet and single carrier gas	Natural Gas Analyzer A Extended and Natural Gas Analyzer B Extended	CP490250
Portable field case For quad channel cabinet and dual carrier gases	Natural Gas Analyzer B Extended[1]	CP490252
Micro-Gasifier for Micro GC Provides controlled evaporazation for Liquid Petroleum Gas (LPG) and Liquefied Natrural Gas (LNG) before sample introduction to the Micro GC. In addition, high-pressure gas samples up to 1,000 psi/7,000 kPa can be reduced without creating cold spots, which prevents discrimination in the sample.	All[2]	G7623A + G7623A#001
Genie filter	All	Multiple p/n's
Stream selector valve	All	Multiple p/n's

[1]: Natural Gas Analyzer B Extended requires the use of a portable field case with dual carrier gases (p/n CP490252) when argon is used as a carrier gas for the CP-MolSieve 5A column channel for helium and hydrogen analysis.

[2]: The Micro-Gasifier can not be used in combination with portable field case.

Dimensions and weight

Product description	inch	cm	inch	cm	inch	cm	lb	kg
Natural Gas Analyzer A and Natural Gas Analyzer B	11	28	6.5	16	12	30	14	6
Natural Gas Analyzer A Extended and Natural Gas Analyzer B Extended	11	28	6.5	16	21.5	55	22	10
Micro GC power supply	1.8	4.5	3.4	8.5	6.7	17	3.3	1.5

Ordering information

The Agilent Natural Gas Analyzers can be purchased by ordering the main part number G3582A and an option number per analyzer type, which are displayed in the table below. The calculation tool for calorific value, also included in the table, should be ordered as a separate option number.

Product description	Part number
Agilent 490 Micro GC Analyzer	G3582A
Agilent 490 Micro GC Natural Gas Analyzer A	G3582A#120
Agilent 490 Micro GC Natural Gas Analyzer A Extended	G3582A#121
Agilent 490 Micro GC Natural Gas Analyzer B	G3582A#122
Agilent 490 Micro GC Natural Gas Analyzer B Extended	G3582A#123
EZReporter for calorific value calculation	G3582A#105

For more information about the 490 micro GC Natural Gas Analyzer or other Micro GC solutions visit our website at www.agilent.com/chem/microgc.

References

[1] 5991-0275EN; Remko Van Loon; Fast Analysis of Natural Gas Using the Agilent 490 Micro GC Natural Gas Analyzer; Application Note; April 2012.

www.agilent.com/chem/microgc

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