PRODUCE ACCURATE, RELIABLE DATA WITH GREATER SPEED AND FLEXIBILITY

The Measure of Confidence

Agilent Refinery Gas Analyzers with Large Valve Oven

The composition of refinery gas differs by source, making its analysis a challenge. Your success requires that Refinery Gas Analyzers reproducibly measure hydrogen, permanent gases, hydrocarbons, and sulfur in refinery and petrochemical streams.

Quickly implement methods and develop workflows

Agilent's Large Valve Oven (LVO) Refinery Gas Analyzers accommodate the multiple valves and columns required for Refinery Gas Analysis. Prior to delivery, our team configures and chemically tests each system. After installation, your team focuses on producing data of value to your operation.

Advantages of the new LVO RGA systems include:

- **Open architecture** which provides easy access to installed components
- **Stable, isothermal temperature control** that produces simultaneous, reproducible analysis of hydrogen sulfide (H_2S) and oxygen (O_2)

Agilent LVO Refinery Gas Analyzers reflect innovative technology and our stringent quality control process.

Factory

- System setup and checkout
- Analyzer configuration chemical test of the application

Delivery

- CD-ROM with operator's manual, method parameters, and checkout data files for easy out-of-the-box operation
- Application-related consumables with re-ordering information

Installation

- On-site verification of method performance by factory-certified support engineer
- Optional application startup assistance

Agilent Technologies

Fast and High-Capacity Refinery Gas Analyzers with Large Valve Oven:

Generating data about operations, unit organization, and finished products

Fast Refinery Gas Analyzer with Large Valve Oven

Precisely analyze refinery gas in just eight minutes

Separating complex mixtures of hydrocarbons and permanent gases can be difficult on a single-channel GC. The Agilent 7890B Fast Refinery Gas Analyzer with LVO, however, is configured for simultaneous analysis using three parallel channels.

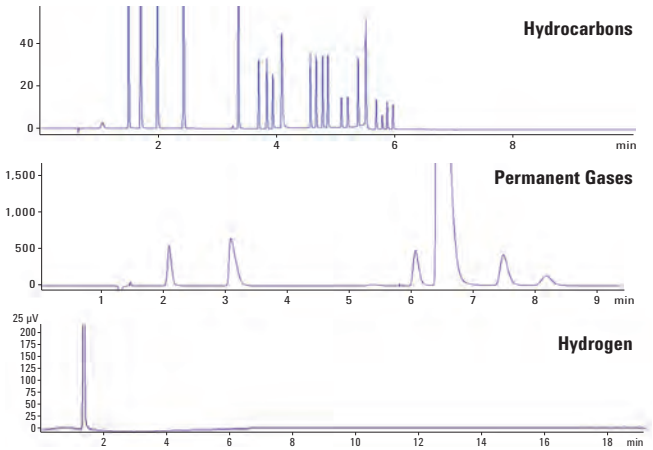
Its external valve oven ensures stable isothermal control of valves and temperature-sensitive columns to produce reliable, reproducible data critical to your operation. What's more, the analyzer's fast cycle time (less than nine minutes) produces composition data – hydrogen, permanent gases, and hydrocarbons (C_6+ with backflush) – quickly.

Due to the increasing costs and potential uncertainty with the supply of helium, Agilent has created a configuration of this Refinery Gas Analyzer that uses nitrogen and hydrogen for its carrier gases. This system not only reduces raw material costs of the carrier gas, but also reduces the risk of system downtime with more certain assurance of supply of carrier gas material.

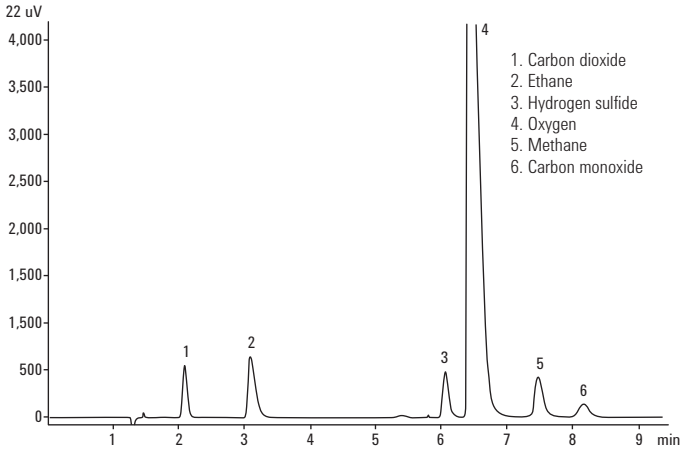
Fast refinery gas analytical performance % RSD for RT and Area

Compound	Concentration	RT	Area
C_6+	0.06	0.027	0.28
Methane (FID)	4.99	0.006	0.14
Ethane (FID)	4	0.011	0.15
n-butane	0.3	0.045	0.15
t-2-butane	0.3	0.059	0.17
1-butane	0.3	0.059	0.21
n-pentane	0.1	0.038	0.20
Hydrogen	12.1	0.036	0.15
Oxygen	2.98	0.026	0.64
Nitrogen	balance	0.022	0.18
Carbon Monoxide	1.52	0.035	0.15
Carbon Dioxide	2.01	0.086	0.15
Methane (TCD)	4.99	0.031	0.16
Ethane (TCD)	4	0.09	0.16
Hydrogen Sulfide	0.5	0.215	4.80

Fast refinery gas analysis with LVO chromatography



The simultaneous analysis of hydrogen, permanent gases and hydrocarbons in a single injection.



Analysis of permanent gases in less than 9 minutes

High-Capacity Refinery Gas Analyzer with Large Valve Oven

Perform a total analysis in less than seventeen minutes

Gathering detailed information from complex mixtures of hydrocarbons and permanent gases can be difficult on a single-channel GC system. That's why we configured our High-Capacity Refinery Gas Analyzer with LVO using standard 1/8" columns for simultaneous analysis of hydrogen, permanent gases, and hydrocarbons.

The external valve oven gives you stable isothermal control of valves and temperature-sensitive columns to generate reliable, reproducible data. In addition, the analyzer's chromatographic capacity for analysis of those complex samples, along with stable analysis for hydrogen and permanent gases – including for O_2 and H_2S.

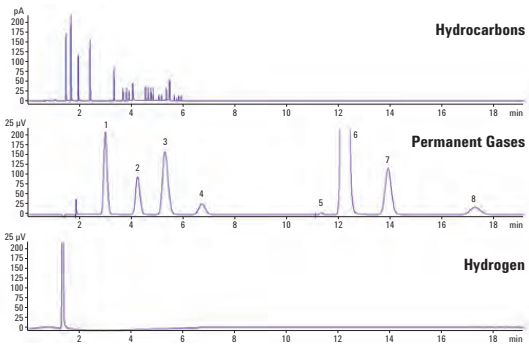
We also offer fully customized analyzers for your unique requirements

Let Agilent help you meet your most challenging demands with specialized technologies that significantly reduce your time from system arrival to final validation. With pre-configured hardware and method-specific separation tools, your analysts can spend more time on calibration and validation per your laboratory's SOPs.

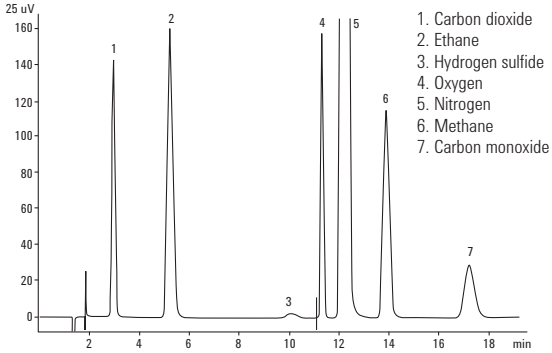
Summary of capabilities for Agilent RGA with LVO

System characteristics	Fast RGA LVO with Micro-packed Column with H_2 and N_2 Carrier Gas (G3445B#533)	Fast RGA LVO with Micro-packed Column and Helium Carrier Gas (G3445B#532)	High-capacity RGA LVO with Standard 1/8" Packed Columns (G3445B#531)
No. of Channels	3	3	3
Analysis time (min.)	<9 min.	<9 min.	17 min.
Hydrocarbon range	C1 - C5 (C_6+ backflush)	C1 - C5 (C_6+ backflush)	C1 - C5 (C_6+ backflush)
Repeatability	<1%	<1%	<1%
Permanent gases	H_2, He, O_2*, N_2, CO_2, CO, H_2S, COS**	H_2, He, O_2*, N_2, CO_2, CO, H_2S, COS**	H_2, He, O_2*, N_2, CO_2, CO, H_2S, COS**
Linear bench space required	68 cm (26.8 in.)	68 cm (26.8 in.)	68 cm (26.8 in.)
Full range H_2 concentrations	Yes	Yes	Yes
Minimum component detection level hydrocarbons	0.01%	0.01%	0.01%
Minimum component detection level permanent gases	0.01%	0.01%	0.01%
Minimum component detection level H_2S	500 ppm	500 ppm	500 ppm
Minimum component detection level COS	300 ppm	300 ppm	300 ppm
Detectors	TCD/TCD/FID	TCD/TCD/FID	TCD/TCD/FID
No. of valves	3	3	3
No. of columns (type)	4 (PLOT & micro-packed)	4 (PLOT & micro-packed)	5 (PLOT & packed)
Suitability			
Configured per	UOP 539(2012)	UOP 539(2012)	ASTM D1945(2014), ASTM D1946(2011), UOP 539(2012)

High-capacity analysis with LVO chromatography



All three channels of the RGA Analyzer showing sample checkout 5190-0519.



TCD1 channel with hydrogen sulfide. LVO at 70 °C.

To review our full line of analyzers, visit **agilent.com/chem/refining**

Agilent has the technology and experience to support your lab with fully customized solutions

Over the past four decades, Agilent has taken an active role in developing methods and applications – many of which have evolved into global standards for energy/fuels analysis.

Our 7890B GC, for example, is the world's most widely used GC system. It features accurate temperature controls and precise injection systems – plus enhanced Electronic Pneumatic Control (EPC) for the best retention times.

In addition, Agilent experts continue to actively participate in ASTM – the world's most trusted source for standards development. We have applied this deep regulatory understanding toward developing methods for our Refinery Gas Analyzers.

Beyond the box:

A full portfolio of customized products, advice, and support

High-quality columns and supplies from the world GC leader

Agilent-engineered GC columns and supplies deliver what your analysts demand – including:

- Long-term reliability and robustness
- Trouble-free instrument operation
- Faster analysis *without* loss of resolution

Local, on-site assistance

No matter where you are on the energy/fuels supply chain, Agilent can help you increase production efficiency... reduce scrap and rework... and enhance product quality.

Best-in-class service and support

Whether you need support for a single instrument or a multi-vendor operation, Agilent service professionals can help solve problems quickly and increase your uptime, so you can focus on what *you* do best.

Custom GC and GC/MS configurations

Let Agilent customize a standard GC or a GC/MS analyzer with specialized columns, valves, tubing inlets, and other add-ons – including an extensive line of consumables and column modules.

Ordering information:

Part Number	Analyzer Description
G3445B#532	Fast RGA LVO with Micro-packed columns with Helium carrier gas
G3445B#531	High-capacity RGA LVO with Standard 1/8" packed columns
G3445B#533	Fast RGA LVO with Micro-packed columns with H_2 and N_2 carrier gases

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Or call **800-227-9770** (in the U.S. or Canada)

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