



REFINERY

GAS

ANALYZER



SCION REFINERY GAS ANALYZERS

THE SOURCE AND COMPOSITION OF REFINERY GASES VARIES CONSIDERABLY. MEASURING GAS COMPOSITION PRECISELY AND ACCURATELY IS A SIGNIFICANT CHALLENGE IN TODAY'S REFINERY OPERATIONS.

SCION Instruments refinery gas analyzers are designed to deliver superior, reliable results for various sources and analysis throughput requirements.



Figure 1: The SCION 8500 GC based RGA Analyzer has outstanding flexibility, analytical power and robustness.



A range of refinery gas analysis (RGA) solutions.

SCION offers RGA solutions to meet the broadest scope of stream sample types and throughput requirements.



A powerful, easy to use GC solution.

The SCION 8500 GC and CompassCDS chromatography software are a very powerful combination designed to achieve the best possible results. In addition, these systems do not require a high degree of operator skills.



A highly flexible solution for analysis.

The SCION RGA solutions can optionally be configured to analyze high pressurized gas and liquefied petroleum gas (LPG) through the use of a fully integrated Micro-Gasifier or Liquid Sampling Valve, giving the flexibility to accommodate a wide range of stream types.



Operational procedures are fully documented.

SCION RGA analyzers not only incorporate proven GC hardware and software but also arrive pre-loaded with analysis methods, and include documentation specific to the application required.



A comprehensive, single-vendor solution.

SCION provides complete solutions. The hardware, software, application optimization, documentation, installation and performance verification are all provided by SCION, offering an all-inclusive, ready-to-use, convenient analysis solution.

SCION offers spares and consumables kits specific to the analyzer, making it easy to order all the columns and spares required for Refinery Gas Analyzers.



KEY BENEFITS

SCION solutions for refinery gas analysis

Typical sources for refinery gases include atmospheric or FCC overheads, ethylene, propylene production, fuel gas, stack gas and off gas from desulfurization. The physical stream types range from gas to highly pressurized gas or liquefied gases. SCION's refinery gas analyzers (RGA) are 'turnkey' systems pre-configured and tuned at the factory to conform to key industry standard methods including: ASTM D7833, ASTM D1946, UOP 539, and DIN EN 15984.

The Refinery Gas Analyzers employ a proven and optimized multi-channel approach. They determine the concentration of individual saturated and unsaturated hydrocarbon components up to and including C5 (C6 and higher components as a composite peak) and all permanent gases, including hydrogen, helium and hydrogen sulfide in a single analysis.

Custom Solutions

The robust Refinery Gas Analyzers are designed for analysis of gaseous streams, and can be modified to fit the needs of the laboratory for specific analysis types. This includes the option to analyze LPGs or high-pressure gases using the integrated micro-gasifier, additional method development to meet different methods like ASTM D2505 (withdrawn), UOP 899, UOP 603, and optional software for calculation of physical properties of the analyzed gases. Many options are available with the expertise of our Custom Solutions team.

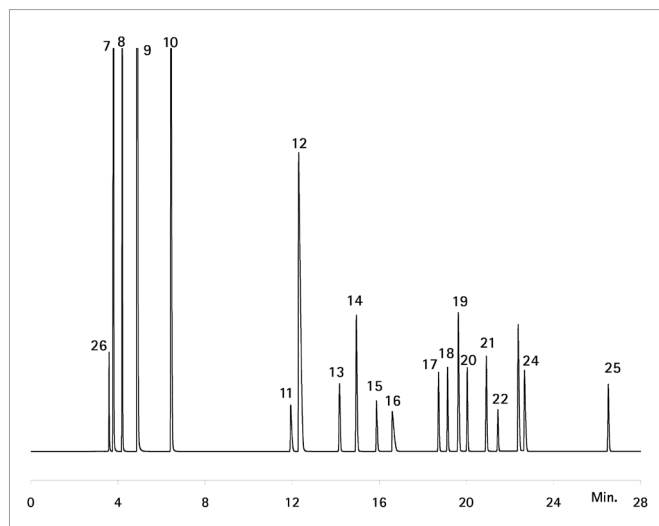


Figure 2: The separation of light hydrocarbons using the Standard RGA.

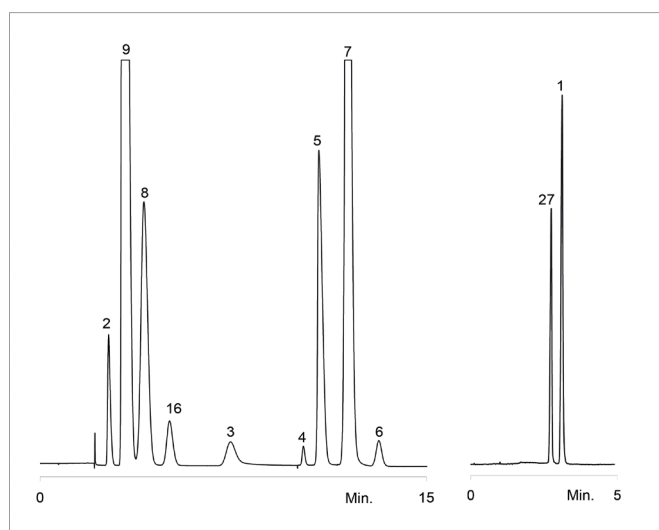


Figure 3: The analysis of the permanent gases and hydrogen (and helium) using the Standard RGA.

Peak Identification

1. Hydrogen	10. Propane	19. i-Butene
2. Carbon dioxide	11. Cyclo Propane	20. c-2-Butene
3. Hydrogen sulfide	12. Propylene	21. i-Pentane
4. Oxygen	13. i-Butane	22. n-Pentane
5. Nitrogen	14. n-Butane	23. 1,3-Butadiene
6. Carbon monoxide	15. Propadiene	24. Propyne
7. Methane	16. Acetylene	25. Butyne
8. Ethane	17. t-2-Butene	26. C6+
9. Ethylene	18. 1-Butene	27. Helium



SCION REFINERY GAS ANALYZERS

SCION offers two RGA systems to meet the widest range of analysis requirements:

Standard RGA

A three-channel SCION 8500 GC with a multi-valve design using both capillary and packed columns. The first channel is explicitly optimized for hydrogen and helium separation, the second is designed for the other permanent gases and the third is for light hydrocarbon. The system is configured and fully tested in accordance with industry standard methods. The total analysis time for all components is under 32 minutes. The standard RGA analyzer is the most powerful tool to analyze the widest range of RGA type streams.

Rapid RGA

A three channel SCION 8500 GC that utilizes a multi-valve design in which the packed columns used in the Standard RGA are replaced by micropacked columns in both the hydrogen and permanent gas channels. Since the micro-packed columns are installed in a separate heated zone, the capillary columns located in the GC oven can be temperature programmed in a more aggressive manner. For high sample analysis demand, the Rapid RGA Analyzer concept substantially reduces overall analysis time by 5 minutes (7 minutes when including H₂S) compared to the 31 minutes with the standard RGA.

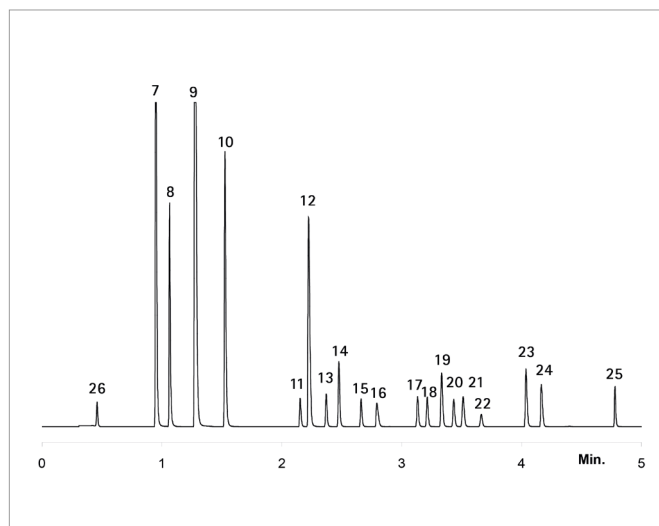


Figure 4: The analysis of light hydrocarbons using the Rapid RGA, with complete separation in less than five minutes.

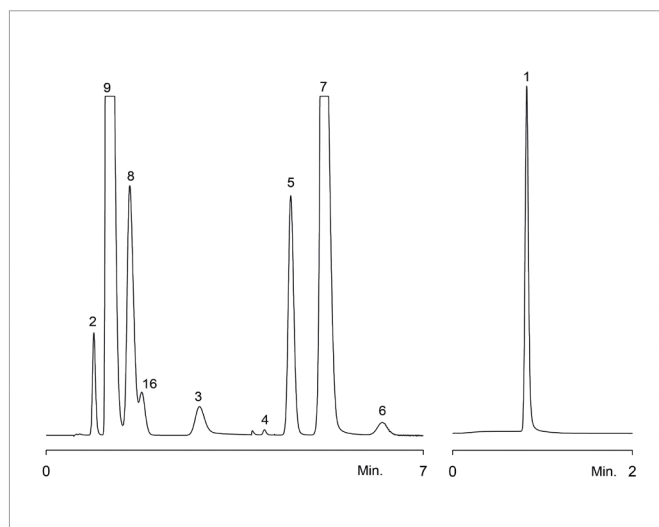


Figure 5: The analysis of permanent gases and hydrogen using the Rapid RGA.

Peak Identification

1. Hydrogen	10. Propane	19. i-Butene
2. Carbon dioxide	11. Cyclo Propane	20. c-2-Butene
3. Hydrogen sulfide	12. Propylene	21. i-Pentane
4. Oxygen	13. i-Butane	22. n-Pentane
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7. Methane	16. Acetylene	25. Butyne
8. Ethane	17. t-2-Butene	26. C6+
9. Ethylene	18. 1-Butene	27. Helium



Figure 7: 'Traditional' RGA with all columns mounted in oven.

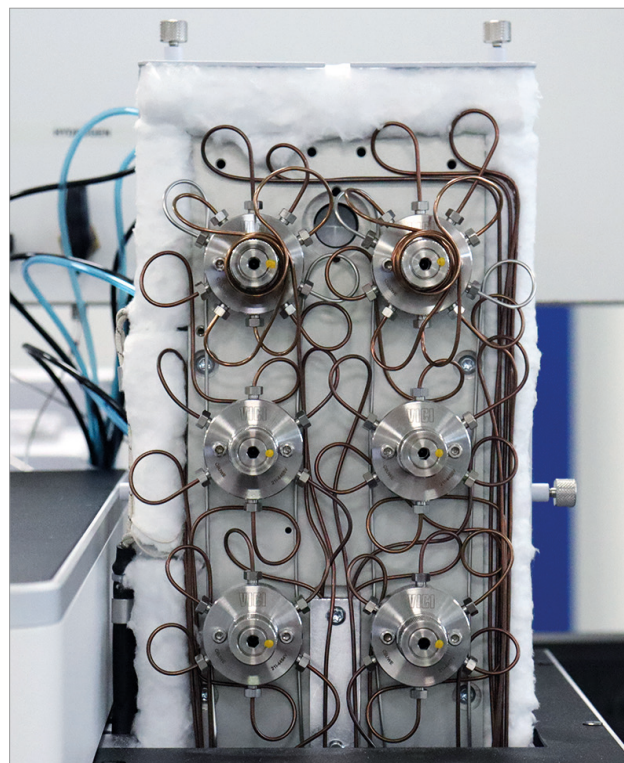


Figure 8: Micro-packed columns mounted in the separate heated zone in the Rapid RGA.

CHARACTERISTICS	STANDARD RGA	RAPID RGA
No. of Channels / Detectors Used	3	3
No. of Column Ovens	1	2
Analysis Time	31.25 min	5 min (7 min incl H ₂ S)
Repeatability	<1%	<1%
Linear Bench Space Required	66 cm / 26 in.	66 cm / 26 in.
Minimum Component Detection Level	≤0.01% all components except H ₂ S = 0.05%	≤0.01% all components except H ₂ S = 0.05%
SUITABILITY		
Typical Refinery Gas	Excellent	Excellent
Impurities in Bulk Ethylene	Excellent	Excellent
Impurities in Bulk Propylene	Excellent	Good
Impurities in Bulk C4	Good	Good

Table 1: RGA Analyzer Characteristics.



SCION-CERTIFIED CONSUMABLES FOR YOUR SCION GC



SCION GC Columns

SCION GC columns span a broad range of column lengths, diameters, stationary phases, and materials including: Fused Silica (FS) and Inert Steel (IS). Ideal for either routine or research type analyses, SCION GC columns cover a wide range of applications and include:

- Standard WCOT (Wall Coated Open Tubular)
- Solid Stationary Phase PLOT (Porous Layer Open Tubular)
- Inert Steel Micro-Packed and Packed



Super Clean™ Gas Filters

SCION Gas Purification Systems have the range to satisfy your needs from individual to combination filters, from Ultra purity combined with Ultra capacity, to all in one solution kits. Innovative features designed into the product yield extensive benefits to the user.

- Ultra-high capacity for long life, less change and improved productivity
- High-purity output ensures 99.9999% Pure Gas
- "Quick connect" fittings for easy, leak-tight filter changes
- Glass internals prevent diffusion; plastic externally for safety
- Easy-to-read indicators for planned maintenance and improved up-time





RGA Spares and RGA Consumables Kits

RGA Spares - 4131842

The RGA Spares kit contains a selection of spare parts to keep the RGA Analyzer functional outside of routine service visits.

RGA Consumable Kit – 4131843

The RGA Consumable kit contains a selection of consumables to cover general maintenance of the RGA Analyzer for a period of 2 years, without the requirement of a Service Engineer.

- Standard WCOT (Wall Coated Open Tubular)
- Solid Stationary Phase PLOT (Porous Layer Open Tubular)
- Inert Steel Micro-Packed and Packed



Download our Parts & Consumable Brochure using the QR Code

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