



Fast refinery gas analyser

- Robust and cost effective
- Gaseous and liquefied gas
- Optional 4th analysis channel
- ASTM D1946, D2163, D2504, D2505, D2598, D3588, D7833, EN ISO 7941, EN 15984, DIN 51666, IP 405, UOP 539, GOST 31371

Get ready for tomorrow's analytics

GAS offers custom configured GC analysers for many application fields for over 50 years. GAS analysers are designed to meet many standardised methods from GPA, ASTM, UOP, ISO, EN and others. The efficient configurations are based on proven GC technology, resulting in robust, highly productive instruments with an optimal return on investment.

The GAS Fast Refinery Gas Analyser offers analysis of refinery gas streams in only 5 minutes. Accurate and reliable measurement is of utmost importance for assuring product quality and precise process control. An optional 4th analysis channel is available for analysis of low sulphur, high purity or additional hydrocarbon composition, resulting in a cost effective analyser with small footprint.

Fast Refinery Gas Analysis in 5 minutes

The GAS Refinery Gas Analyser (RGA, see figure 1), measures all components of interest in only 5 minutes (7 minutes in case of H_2S). Three independent channels are used for the analysis of hydrogen, permanent gases, and hydrocarbons (figure 2). Micropacked columns offer low carrier gas consumption and are mounted in the valve oven for isothermal operation, while capillary columns are used in the temperature programmed oven for fast and detailed hydrocarbon analysis. Sulfinert tubing guarantees optimal analysis of sulphur components. Diaphragm valves and InstantConnect detector technology result in a robust and flexible instrument with >99% uptime.



Figure 1 RGA on GC1600

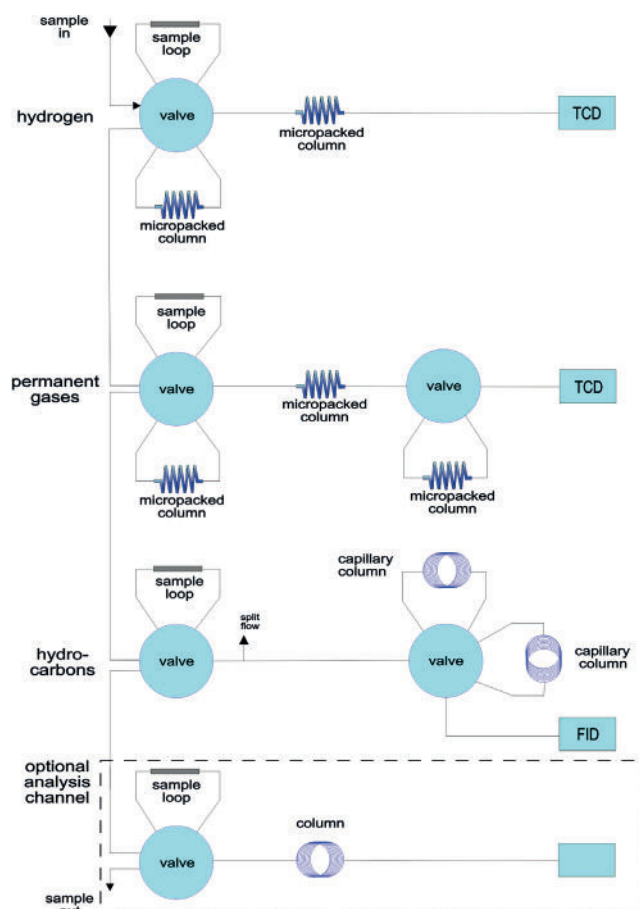


Figure 2 Diagram RGA

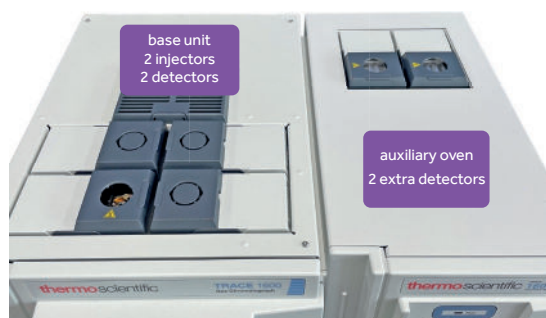


Figure 3 GC1600 base unit and auxiliary valve oven



Figure 4 InstantConnect injectors and detectors

Results



Figure 5 helium and hydrogen on TCD (N₂ or Ar carrier gas)

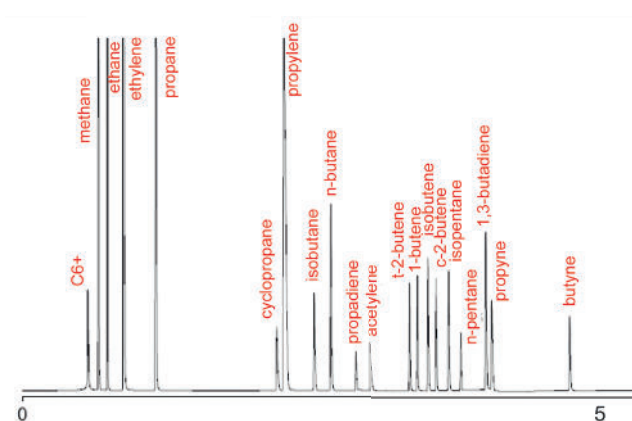


Figure 6 C₁-C₆ hydrocarbons on FID (He or H₂ carrier gas)

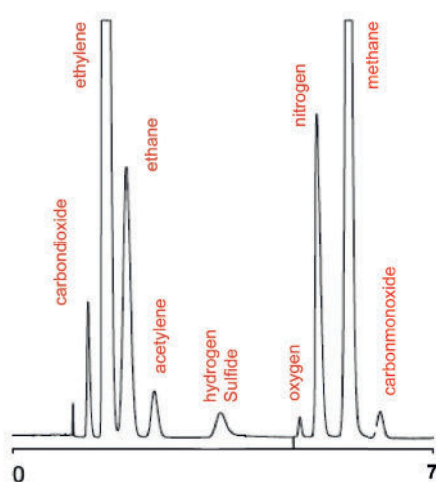


Figure 7 permanent gases on TCD (He carrier gas)

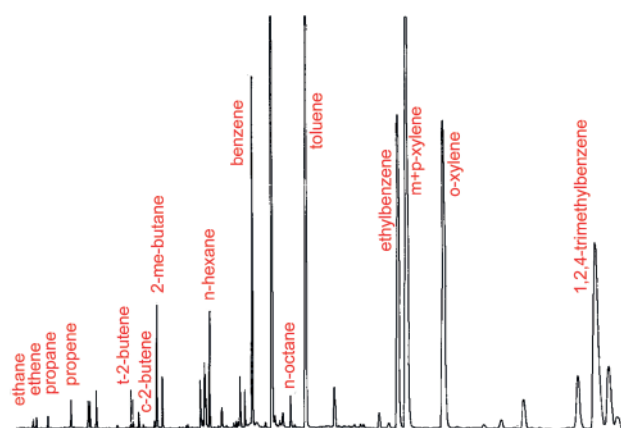


Figure 8 Extended HC analysis on FID
(emission gas sample; He or H₂ carrier gas)

Cost effective: 4th channel option

An optional 4th analysis channel is available for additional analysis methods, like analysis of sulphur components using (P)FPD (Flame Photometric Detector), ppb level permanent gases using PDD (Pulsed Discharge Detector) or oxygenates. In this way a cost effective and space saving instrument is offered.

Other options:

- Vaporiser for gaseous injection of LPG samples
- Sample Securitiser for liquid injection of LPG samples (requires LSV)
- Stop flow valve for excellent repeatability in case of sample pressure fluctuation
- Capillary column on channel 2 for Ar/O₂ separation
- Automatic result compensation for barometric pressure variation

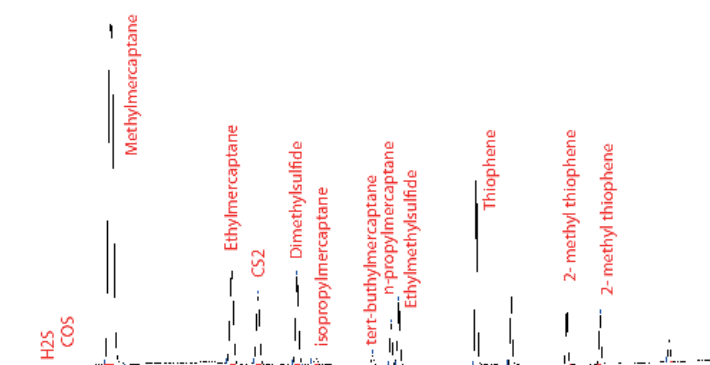


Figure 9 Example of 4th analysis channel: Low level sulphur using PFPD.
2-5 ppm level. LOD: 25 ppb

Specification

Standard methods:	ASTM D1946, D2163, D2504, D2505, D2598, D3588, D7833, EN ISO 7941, EN 15984, DIN 51666, IP 405, UOP 539, GOST 31371
Configuration:	Three channel instrument using 2 TCD's and 1 FID, based on Thermo Trace 1600 GC with auxiliary valve/column oven using micropacked and capillary columns
Optional:	<p>Injection: gas sampling valves with fixed sample loops</p> <ul style="list-style-type: none"> - 4th independent channel (with 4th detector) for additional analysis methods (low sulfur, high purity analysis, extended hydrocarbons, LPG, etc.) - Stop flow valve for gas injection at ambient pressure (improved repeatability), or back-pressure regulator for injection at constant pressure - High temperature valves (up to 250 °C) - Additional isothermal oven for permanent gas channels in case of high temperature auxiliary oven - Liquid sampling valve (LSV) and Sample Securitiser for liquid LPG injection - Vaporiser for injection of LPG in gaseous phase - Capillary column on channel 2 (permanent gases) for Argon/Oxygen separation - Automatic result compensation for barometric pressure variation
Sample tubing:	Sulfinert® tubing for inert sample path (H ₂ S analysis)
Analytes:	C ₁ -C ₆ hydrocarbons, C ₆ +, He, H ₂ , O ₂ , N ₂ , CH ₄ , CO, CO ₂ , H ₂ S, C ₇ , C ₈ , C ₉ , BTEX
Application range:	Atmospheric overhead, Ethylene, FCC overhead, Fuel gas, Recycle gas, Desulphuriser gas, LPG, Propane, Butane, Butadiene, Propylene
Sample requirements:	The sample must be offered to the analyser as a gas. Optional vaporiser facility available for LPG samples. Sample Securitiser available for liquid injection of LPG samples with LSV (liquid sampling valve) at hydrocarbon channel.
Analysis Time:	5 minutes; including H ₂ S: 7 minutes
Minimum Detectability:	Better than 0.005% for all individual components (using carrier gases: He for permanent gas channel; Ar/N ₂ for H ₂ channel)
Dynamic Range:	4 decades for all components on TCD; 7 decades on FID
Repeatability:	Better than 1% RSD at 1% concentration level for all analytes specified, measured over 10 consecutive runs
Data systems:	Chromeleon
Calculations:	Customised calculations available



Figure 10 InstantConnect FPD module (optional 4th channel detector)



Figure 11 Sample securitiser for LPG samples



Figure 12 Sample stream selector

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