Mach-RGA

The Fast Refinery Gas Analyzer

jas Analyzer

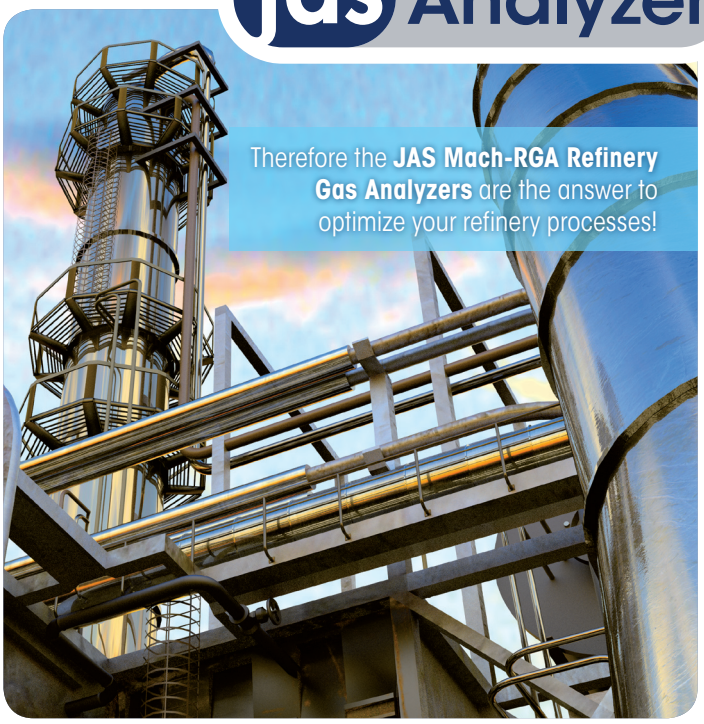
JAS Mach-RGA

Refinery Gas Analyzer

Refinery gas is used as a fuel gas or as feedstock for further chemical processing. US EPA Title V Permit requires operators to monitor and report the composition of refinery gas used as fuel or burnt through refinery flares. Optimization and control of the refinery gas process requires an accurate and fast analyzer.

JAS Mach-RGA analyzer is ideal for the fast and complete analysis of the refinery gas. Simultaneous three-channel measurement enables the separation of permanent gases and light hydrocarbons with excellent sensitivity, linearity and repeatability in less than 5 min. (7 min. if including H_2S.)

The Mach-RGA analyzer is a turn-key system with flexibility. By making minor modifications, the analyzer can be used for the analysis of propane, propylene and butanes in gas or compressed liquid phase.



The Mach-RGA analyzer complies with the following methods ASTM D1946, ASTM D2163, UOP 539 and DIN 51666.

JAS Mach-RGA analyzer

The JAS Mach-RGA analyzer is based on the Agilent Technologies' 7890 GC that is configured with three separation channels: Two TCD channels are used for the quantification of permanent gases and a FID channel is used for the quantification of light hydrocarbons. With the combination of unique JAS isothermal valve box, valve automation technology, optimized GC column set and JAS Report Generator software, **the JAS Mach-RGA analyzer distinguishes itself from competitors as a prime turn-key system for fast refinery gas analysis.**

The analyzer uses an optimized configuration to determine the concentration of individual saturated and unsaturated hydrocarbon components from C_1 to C_{6+} (C_{6+} as a composite peak) and analyze all permanent gases present in Refinery Gases. Micro-packed columns are installed in a separate heated zone and the capillary column is located in the GC oven.
This configuration allows oven temperature to be programmed in a more aggressive manner and provides a substantial reduction in overall analysis time from ~ 25 minutes to 5 minutes (or 7 minutes with H_2S) for high throughput.

Included in the system, the JAS Report Generator is fully integrated with Agilent ChemStation™ for flexible report generation and gas property calculations.

JAS Mach-RGA offers a broad sample scope:

- All Refinery Process Gases
- Petrochemical Gases such as Propylene, Butadiene etc.
- Shale Gas and LPG products from Gas Process Industry

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EXCELLENT DETECTION LIMITS

JAS uses de-activated tubing to avoid adsorption of (Sulfur) compounds: this contributes to more accurate results.

The quantification limits (QL) of JAS Mach-RGA system are:

- 0.02% for inert gases
- 0.01% for hydrocarbons
- 0.1% for hydrogen sulfide

MACH-RGA is a turn-key system which means JAS commits to all the followings:

1. **Physical Test:** Check of completeness of all hardware for the application.
2. **Functional Test:** Testing of all hardware components.
3. **Application Test:** Evaluation of the RGA on performance following requested standard methods.
4. **Reports & Methods:** Documentation and test reports for the requested methods.
5. **Shipment:** Shipment of the complete system to the customer.
6. **Installation & Familiarization:** Installation of the system and complete functionality test at the customer site.

MACH-RGA: KEY SOLUTION ANALYZER BENEFITS

JAS guarantees your application!

- The JAS Report Generator with calculation of gas properties that can be tailored to your needs and is fully integrated into Agilent ChemStation™
- The system makes use of the proven quality products from Agilent Technologies
- All flows and pressures are fully EPC controlled
- JAS valve system and heated zones come in a valve box designed for reliable operation and easy maintenance.

FIELDS of APPLICATIONS

- Oil Refineries
- Gas processing plants
- Petrochemical plants
- R&D

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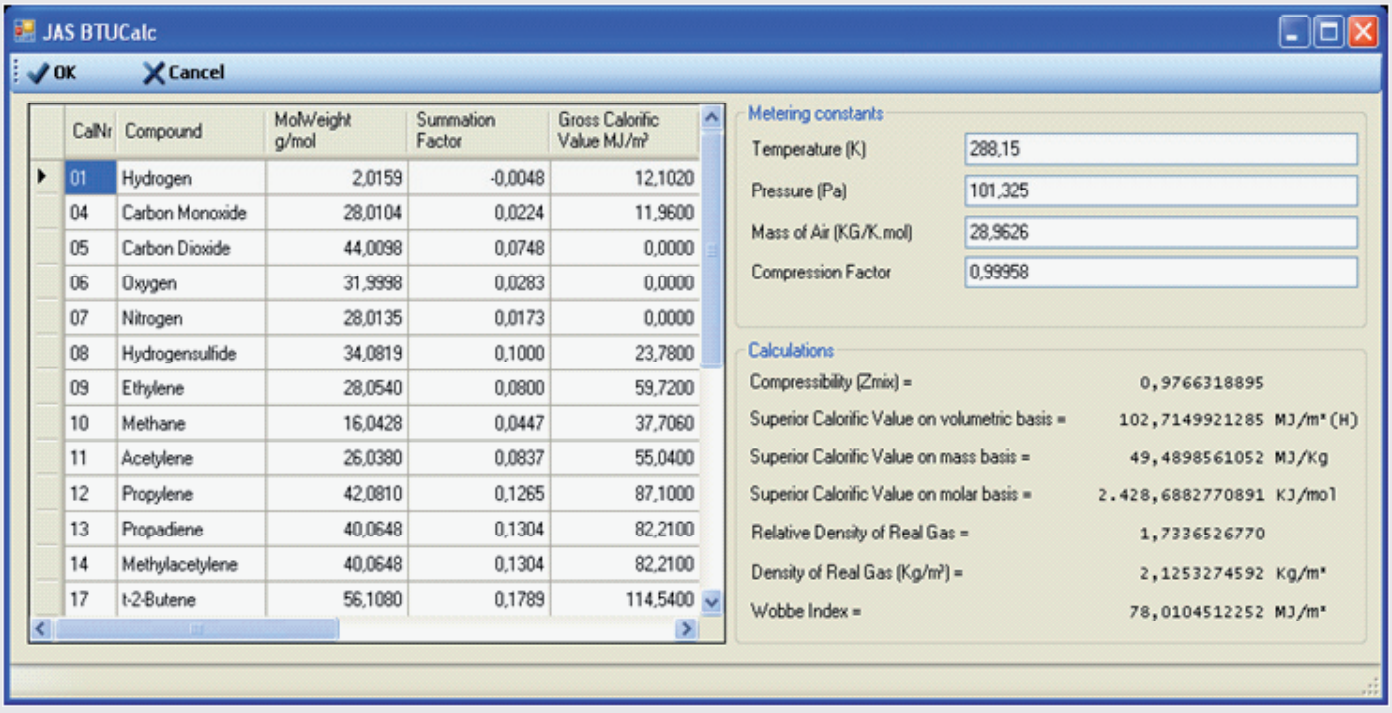
SYSTEM CONFIGURATION

Hardware: Agilent GC 7890, TCD x 2, FID, Special Valve Box, PC Bundle, Proprietary Capillary and Micro-packed Columns.

Software: Special JAS Report Generator integrated into the Agilent ChemStation™.

JAS REPORT GENERATOR, A DEDICATED UNIQUE SOFTWARE

This Software has the capability to automatically calculate physical properties selected by the user after each analysis. The S/W uses the result table generated in ChemStation™ to calculate needed properties according to ISO 6976. A standard database for gases with flexibility for users to modify for special needed is included in the software. Additional conditions such as temperature and pressure can be edited as well.



SOFTWARE FEATURES

- Calculations according to ISO 6976
- Expandable Compound Table
- Flexible Report Generation, allows customization

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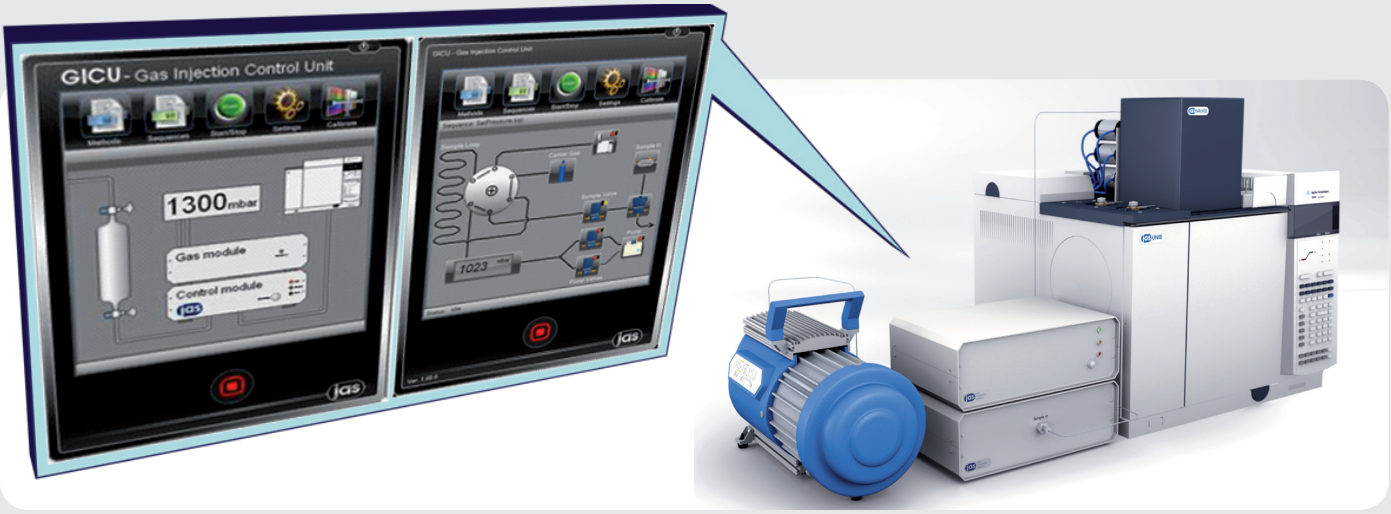
UPGRADE OPTIONS:

1. **Option LPG (Liquified Petroleum Gas):**
   - All JAS RGA solutions can be configured to analyze gas and pressurized liquids (LPG)
   - Additional liquid sampling valve
   - Analysis of all relevant liquid gas streams in less than 5 minutes

2. **Option Traces of CO, CO_2:**
   - JAS methanizer
   - Trace analysis of CO and CO_2 in the range of 0.1to 100 ppm

3. **Option JAS GICU - Gas Injection Control Unit**
   - The GICU System is a standalone modular system and fully controlled by dedicated software that can be integrated in the Agilent ChemStation™ method sequence:



The GICU allows gases to fill the GC sample loop with user specified pressures. By varying the pressure the sample concentration can be controlled:

- As the pressure in the sample loop can be controlled with the GICU system, a multi-level calibration is possible with only using one standard gas.
- GICU allows sub ambient pressure injection of high concentration samples to avoid detector saturation and ensure samples are analyzed within the dynamic range.
- GICU allows constant pressure in the sampling loop and greatly increases the repeatability of gas sample injection.

GICU BENEFITS:

- Simple calibration to run gas samples under the same or similar conditions
- GICU can handle different gas samples with different pressures
- Possibility to adjust the sample loop pressure from 50mbar to 1800mbar (abs.)
- GICU is using an automated sampling system with a pre-programmed procedure for flushing and cleaning of the gas path of the system: ideal when handling hazardous samples.
- Setup of the program is easy and user-friendly and can be incorporated into specific selected GC methods

GICU starts the GC run after reaching the set pressure or when the GICU method is complete.

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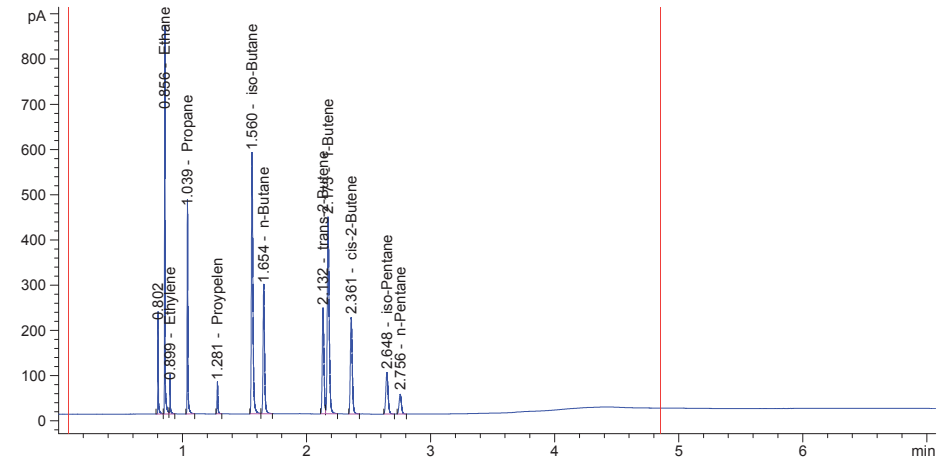
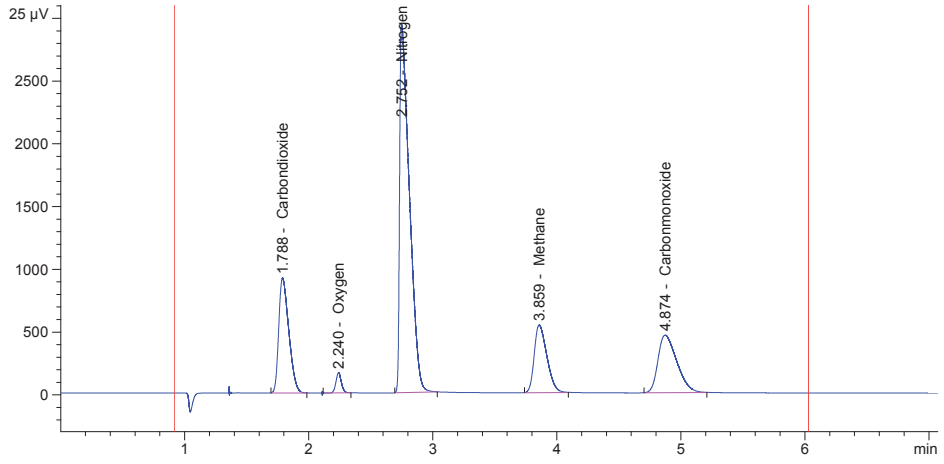
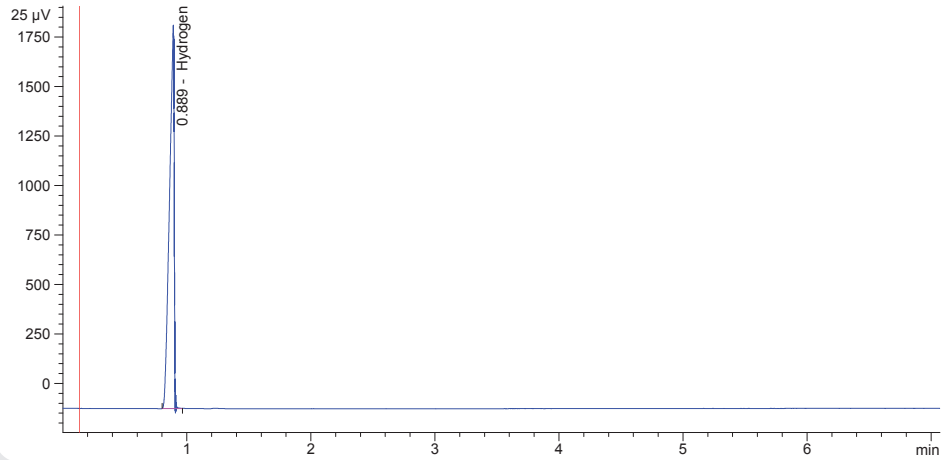
TYPICAL CHROMATOGRAMS

Example of Final Check Test of the complete system:







About joint analytical systems

Since 1995 JAS has been a major partner and Value Added Reseller of Agilent Technologies. We are an innovative-driven organization that offers customized solutions for GC, GCxGC, µGC, GC-AED, GC-MS, GC-QQQ, LC, LC-MS, LC-QQQ and Q-TOF LC-MS applications.

JAS serves key industries such as

- Chemical
- Environmental
- Food and Flavor
- Forensic
- Mechanical Engineering
- Petrochemical
- Pharmaceutical

JAS Products for GC

- Atomic Emission Detector
- CryoTrap
- Customized Valving System
- EzPrep - Preparative Fraction Collector
- Olfactometer
- Scotti-RFID Systems
- UNIS Inlets

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