

Specifications



- Standardised method:** ASTM D2163, D4424, D5303, D5504, D6159, D6228, D7756  
IP 264/72, 405, CD/96/97  
ISO 7941.
- Configuration:** 1 or 2 channel instrument for liquid injection of LPG samples. Detector depending on application (for example FID for hydrocarbons or PFPD for sulfur compounds). Pressure controlled injection of LPG samples.
- Optional:**
- Gas injection valve (with optional stop-flow valve).
  - Backflush to detector of C<sub>5</sub>+ or C<sub>6</sub>+ fraction.
  - Multi column system for specific component separations.
  - Auto sampler for 10 sample cylinders (see picture).
  - Pressure facility including bracket for sample cylinders
  - Vaporiser facility for injection of LPG samples in gaseous phase.
- Sample tubing:** Sulfinert® tubing for inert sample path (H<sub>2</sub>S analysis).
- Application:** Custom configured analyser for the analysis of LPG and gaseous samples, containing, for example hydrocarbons, sulfur compounds or oxygenate compounds. The instrument is factory tuned for the specific application intended.
- Sample requirements:** See our pre-installation guide for additional requirements.
- Analysis Time:** Depending on application.
- Minimum detectability:** Hydrocarbons: down to 0.5 ppm, depending on sample loop volume and separation  
sulfur compounds: better than 100 ppb S, depending on sample loop volume and separation.
- Dynamic Range:** Four decades for all components.

For more information:

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APPLICATION NOTE 203WA0712F

LPG Analyser

ASTM D2163, D4424,  
D5303, D5504, D6159,  
D6228, D7756  
IP 264/72, 405, CD/96/97  
ISO 7941

Introduction

Global Analyser Solutions offers custom configured GC analysers for complex separations, data processing and reporting. We have over 35 years of experience in designing and building turnkey analysers for many application fields. We invite you to take advantage of our latest hardware, software and column technologies to achieve the best possible results.

Our analysers are designed to meet many accepted standard methods (like ASTM, UOP, ISO, etc) in the Oil and Gas industry. The efficient hardware configurations are based on proven GC technology, resulting in rigid instruments with an optimal return on investment. This Global Analyser Solutions LPG analyser is the customised solution for the determination of several components in Liquefied Petroleum Gases like volatile hydrocarbons, oxygenates and sulfur components.

Analyser



Picture 1. LSV InstantConnect and Pressure Facility

The G-A-S LPG analyser is based on Thermo Trace 1300/1310 GC. This instrument uses the InterConnect module technology, offering a new module design for injectors, detectors and LSV (Liquid Sampling Valve). The user can exchange modules in minutes, for high uptime and low maintenance costs.

Diagram 1 shows the basic configuration for high pressure liquid sample introduction. The pressure in the sample cylinder is raised to 7-20 bar (depending on the sample), while a dedicated LPG pressure regulator controls the pressure at the outlet of the sample valve. In this way, the liquid state of the sample in the valve is guaranteed, which is essential for quantitative analysis. This procedure excludes critical adjustments of needle valves, which is often necessary for this type of sample. Table 1 (next page) shows the excellent repeatability of successive injections of a butane / iso-butane sample.

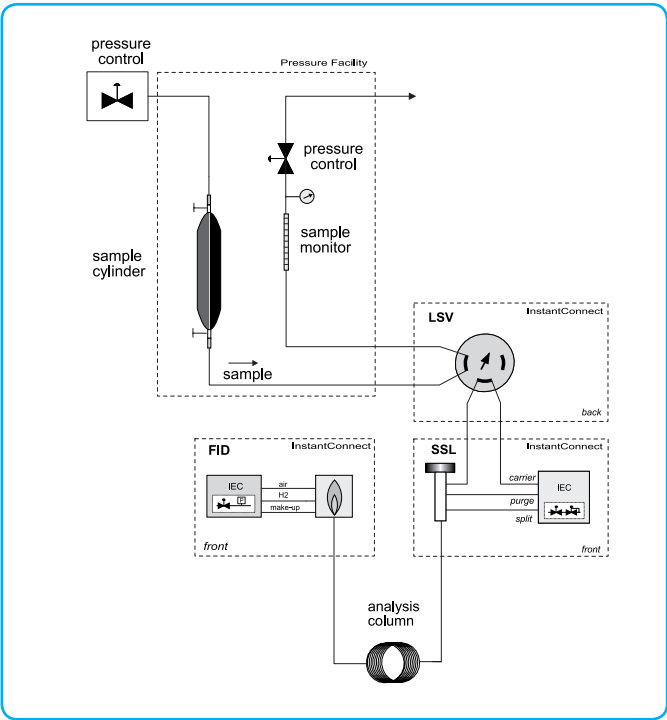


Diagram 1: LPG analyser, basic configuration



Picture 2. InstantConnect injector, detector and valve technology

Chromatograms and options

Chromatogram 1 shows a typical LPG application of impurities in propylene using FID detection. In chromatogram 2, sulfur components in propylene are analysed, using PFPD detection (Pulsed Flame Photometric Detector). The concentration level is 1 ppm for each component.

Gas injection valve

The basic system is equipped with a liquid sample valve for Liquefied Petroleum Gas samples. A gas injection valve can be added to expand the application field of the analyser to gaseous sample streams like ethylene.

Vaporiser

Injection of LPG samples by liquid injection valve is the preferred technique. But company procedures may require injection of the samples in gaseous phase. The Vaporiser facility is available for this purpose. This option uses the same cabinet and sample mount as the Pressure facility, and has a implemented heated vaporising regulator.

Backflush option

Laboratories often require analysis of C1-C5 and C6+ hydrocarbons. For this purpose, a 'backflush to detector' option is available based on valve switching. Backflush configurations based on Deans switching are available as well.

Multi-channel instruments

Different configurations can be combined into one instrument. For instance analysis of hydrocarbons and sulfur components in a single instrument, or an additional hydrocarbon channel for a specific separation like propyne in 1,3-butadiene.

LPG autosampler

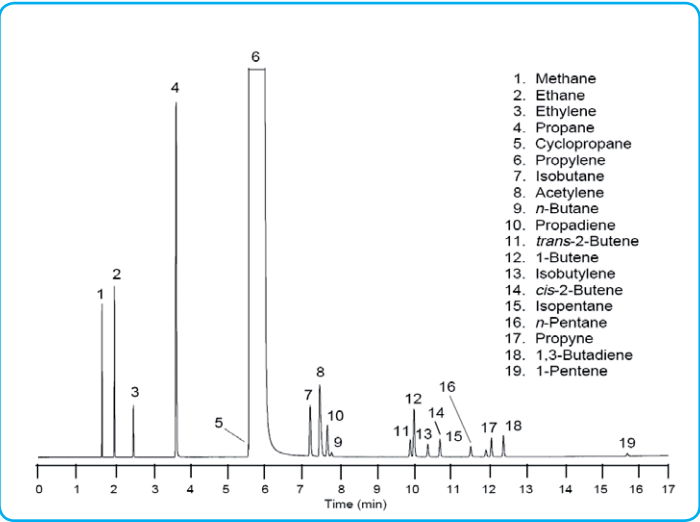
Picture 3 shows the optional LPG autosampler. 10 cylinders are analysed unattended.

LGI : analysis of oil in LPG

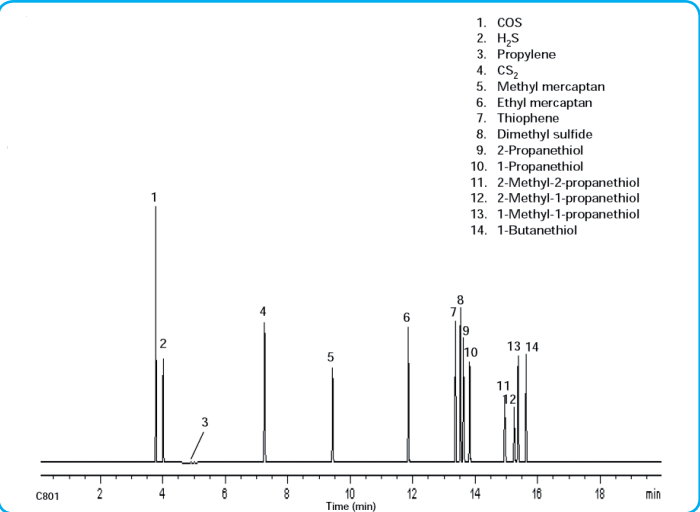
The unique Liquefied Gas Injector analyses oil and other heavy components in LPG and Butadiene down to low ppm level. See the dedicated application note about this analyser.



Picture 3: optional LPG autosampler



Chromatogram 1: impurities in propylene, FID detection



Chromatogram 2: sulfur component (1 ppm level) in propylene. PFPD detection.

TRACE GC-FID	I-Butane	Butane
Instrument Name	Area	Area
Trace GC Valve Inj	75405191.00	112744059.00
Trace GC Valve Inj	74606676.00	111717664.00
Trace GC Valve Inj	74925955.00	111509427.00
Trace GC Valve Inj	75377429.00	112744895.00
Trace GC Valve Inj	75092654.00	112570174.00
Trace GC Valve Inj	73793171.00	110533659.00
Trace GC Valve Inj	74145739.00	110950372.00
Trace GC Valve Inj	74078879.00	110862094.00
Trace GC Valve Inj	74135522.00	111265145.00
Min:	73793171.00	110533659.00
Max:	75405191.00	112744895.00
Mean:	74617912.89	111655276.56
Std Dev:	606575.71	849350.84
%RSD:	0.81	0.76

Table 1: repeatability of the liquid sample injection