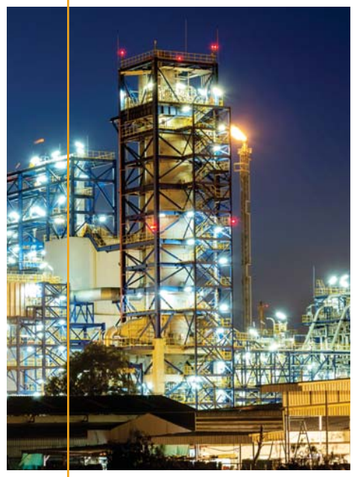
Wasson-ECE RGA Configuration Options

Application Number	383	383(D)-OXY*	383(D)-MET*	383D-DHA*	383D-SCD*	583	783(D)*
Description	*Standard RGA*	*RGA and oxygenates*	*RGA and trace CO/CO_2*	*RGA and DHA*	*RGA and sulfurs*	*Fast RGA*	*RGA and heavy hydrocarbons*
Runtime (min.)	<20	<20/22	<20	<20/140	<20/25	<7	<20
RGA Analyses							
Fixed Gases	●	●	●	●	●	●	●
C_1-C_5						●	
C_1-C_7, Configurable**	●	●	●	●	●		●
H_2S	●	●	●	●	●	●	●
Sulfurs					●		
Oxygenates		●					
Trace CO/CO_2			●				
C_5-C_{12}							●
BTEX							●
DHA				●			●
Optional Analytical Upgrades							
Ammonia*	●						●
Analysis of LP Samples ***	●	●	●	●		●	●
Separation of O_2 and Ar	●	●	●	●	●	●	●
Inert sample lines	●	●	●	●	●	●	●
Standard Method Compliance (depending upon final configuration)							
ASTM D1946	●	●	●	●	●	●	●
ASTM D2163	●	●	●	●	●	●	●
ASTM D5134				●			
ASTM D5504					●		
ASTM D5623					●		
ASTM D6729				●			
ASTM D6730				●			
ASTM D7423		●					
ASTM D7754		●					
ASTM D7833	●	●	●	●	●	●	●
UOP 539	●	●	●	●	●	●	●
UOP 603			●				

(D) Refers to a four detector system utilizing dual Wasson-ECE TCDs
*For the complete analysis multiple methods are developed
** User can select between a C_6+, C_7+, or C_9+ backflush
***Liquid sampling valves or On-board Vaporizer available depending on system configuration



Wasson-ECE Instrumentation Refinery Gas Analyzers

Wasson-ECE Refinery Gas Analyzers (RGA) are an integral part of any HPI lab. These instruments often carry the heaviest sample loads because of the critical information they provide. RGAs provide valuable information regarding plant operation, unit optimization, and quality control. Our RGA systems are designed for flexibility while maintaining the accurate and repeatable results our clients have come to expect.

As a premier channel partner of Agilent Technologies, Wasson-ECE extends the capabilities of the 7890 Gas Chromatograph to meet key requirements of refinery gas analysis. The Wasson-ECE RGA incorporates our specially designed auxiliary oven, which holds up to five additional rotary valves and six columns, extending the analysis capabilities far beyond traditional methods.

At Wasson-ECE we strive to produce a product that is innovative and state-of-the-art to help our customers overcome their analytical challenges. The flexibility of our RGA systems can ease bench space issues by combining analyses into a single instrument while maintaining an easy to service system with minimal downtime.

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WASSON·ECE INSTRUMENTATION

RGA Features

- **Complete range of analyzers** for refinery and other petroleum gases and liquids
- **Includes method development, selection of valves**, **and columns** in all configurations
- **Dual TCDs and a single FID** for the simultaneous analysis of fixed gases and hydrocarbons
- **Wasson-ECE Auxiliary Oven** which provides a second thermal zone
- **Customized reports** including calculations for mole %, weight %, or volume %, and calorific value available
- **Optional liquid sampling valves or On-board Vaporizer** expands the analytical capabilities to liquefied gases
- **Optional fourth detector** available on all Super RGA configurations

Wasson-ECE Super RGA

Wasson-ECE has the unique ability to add a fourth detector to the GC, building our Super RGA series of analyzers. The additional detector expands the analytical capabilities of the standard RGA to accommodate applications such as sulfurs, oxygenates, heavy hydrocarbons, and trace CO/CO_2. This increased flexibility in configurations can reduce the number of GC's used in a lab, saving clients valuable bench space and time.

Performance Guarantee

From hardware to analysis we stand behind our quoted application. Prior to shipping the instrument, chromatograms are submitted for customer approval. Performance is guaranteed to the clients actual sample, not just a generic standard. Any problems with the application during the first year are covered under warranty for an unparalleled performance guarantee.

The Wasson-ECE Turn-key Process

Sales

- Application designed to customer's requirements

Factory Application

- Method development and application setup
- Customer samples are run to verify performance
- Chromatograms are sent for client approval
- Factory acceptance training if desired

Installation

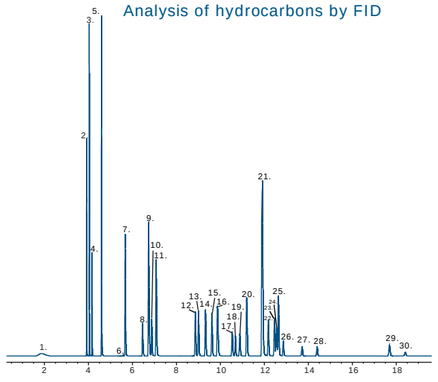
- Experienced Wasson Field Service Technician
- Analysis of client's real world samples
- Calibration and familiarization

Customer Satisfaction

- Follow up after installation
- Knowledgeable and responsive service team
- Optional preventative maintenance visits or service contracts

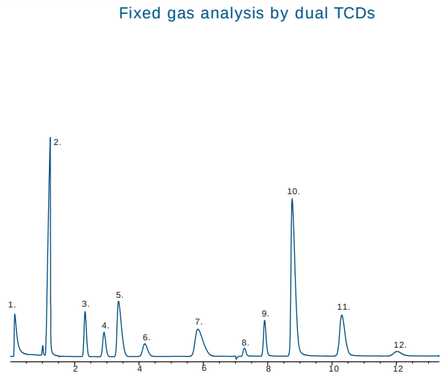
383-Standard Refinery Gas Analysis

Analysis of hydrocarbons by FID



1. C_6+ backflush
2. Methane
3. Ethane
4. Ethylene
5. Propane
6. Cyclopropane
7. Propylene
8. Acetylene
9. Isobutane
10. Propadiene
11. n-Butane
12. t-2-Butene
13. 1-Butene
14. Isobutylene
15. c-2-Butene
16. Neopentane
17. Isopentane
18. Methyl acetylene
19. n-Pentane
20. 1,3-Butadiene
21. 3-Methyl-1-butene
22. t-2-Pentene
23. 2-Methyl-2-butene
24. 1-Pentene
25. 2-Methyl-1-butene
26. c-2-Pentene
27. Neohexane
28. n-Hexane
29. n-Heptane
30. Benzene

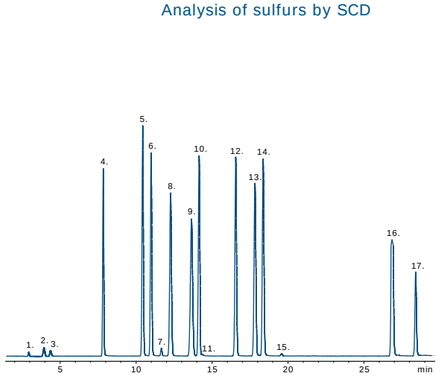
Fixed gas analysis by dual TCDs



1. Valve switch
2. Hydrogen
3. Carbon dioxide
4. Ethylene
5. Ethane
6. Acetylene
7. Hydrogen sulfide
8. Hydrogen (non-quantifiable)
9. Argon/oxygen
10. Nitrogen
11. Methane
12. Carbon monoxide

383D-SCD

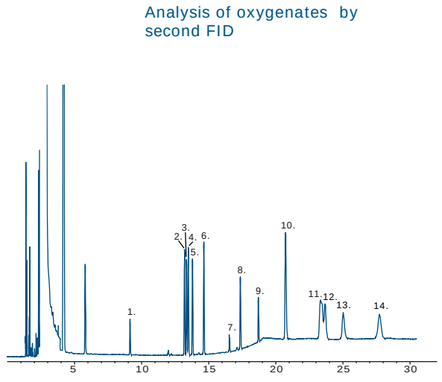
Analysis of sulfurs by SCD



1. Hydrogen sulfide
2. Carbonyl sulfide
3. Sulfur dioxide
4. Methyl mercaptan
5. Ethyl mercaptan
6. Dimethyl sulfide
7. Carbon disulfide
8. Isopropyl mercaptan
9. t-Butyl mercaptan
10. n-Propyl mercaptan
11. Ethyl methyl sulfide
12. Thiophene/2-butanethiol
13. Diethyl sulfide
14. n-Butyl mercaptan
15. Dimethyl disulfide
16. Diethyl disulfide
17. Phenyl mercaptan

383D-OXY

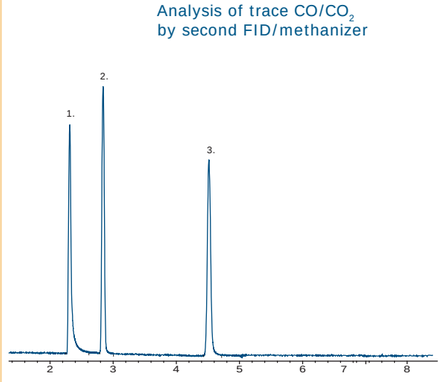
Analysis of oxygenates by second FID



1. Dimethyl ether
2. Ethyl tert-butyl ether
3. Methyl tert-butyl ether
4. Diisopropyl ether
5. sec-Butyl methyl ether
6. tert-Amyl methyl ether
7. Methanol
8. Acetone
9. Ethanol
10. iso-/n-Propanol composite
11. iso-/2-Butanol composite
12. tert-Butanol
13. n-Butanol
14. tert-Amyl alcohol

383D-MET

Analysis of trace CO/CO_2 by second FID/methanizer



1. Carbon monoxide
2. Methane
3. Carbon dioxide