



CMS5000

Monitoring System
for Air Analysis

Unattended, On-Site VOC Air Monitoring

The INFICON CMS5000 Monitoring System is a self-contained system utilizing GC (Gas Chromatograph) technology for continuous, unattended remote monitoring of air.

CMS5000 performs complex analyses under the most demanding conditions. The programmable CMS IQ software allows you to manage the sample collection and analysis sequence, or you can simply use one of the included quantitative default methods. The analytical data is representative of real-time sampling - providing the answers you need to make better and faster decisions about potentially critical issues. Concentrations can be accurately measured and reported in minutes.

CONTINUOUS ON-LINE MONITORING

Building upon the success of its predecessor the CMS100 Chemical Monitoring System, the CMS5000 was designed to require virtually no operator involvement following initial installation and setup. Volatile Organic Compounds (VOCs) and Toxic Industrial Chemicals (TICs) in air are analyzed on-site for continuous on-line monitoring of multiple chemicals in a single run. CMS5000 also provides the capability to automatically upload analysis results after every run via FTP to virtually anywhere in the world. The user can remotely access the system to view data or select an alternate method. On-site system integration is managed utilizing a wireless communication port, Ethernet communication, or Input/Output (I/O). Analyses are also maintained on the instrument's internal storage.

ADVANCED TECHNOLOGY YIELDS RELIABLE AIR ANALYSIS

The robust CMS5000 was designed with years of reliable operation in mind. The wall-mounted NEMA-4x type enclosure is air and water tight. The front panel screen displays status in real-time.

SENSITIVE DETECTION TO PARTS-PER-TRILLION

The Micro Argon Ionization Detector (MAID) provides sensitive detection of organic compounds having an ionization potential of 11.7 eV or below. These compounds include halomethanes and

FEATURES AT A GLANCE

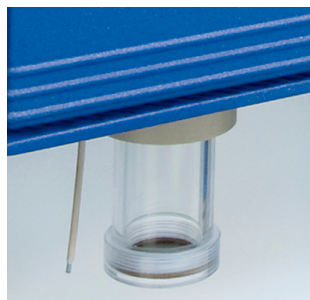
- Continuous unattended monitoring using on-board default methods
- Low consumable load
- Robust, reliable design
- Minimal maintenance
- Can also be configured for water monitoring
- Simple operation requires no formal training

APPLICATIONS

- Underground transportation systems
- Industrial hygiene
- Fenceline monitoring
- Indoor air quality

haloethanes, which are sometimes difficult to detect by other common field detectors. The CMS5000 Monitoring System can even detect these hydrocarbons down to parts-per-trillion (PPT) levels. The EPA TO-14 calibration mix was analyzed on the CMS5000 using column temperature programming to demonstrate the resolution and overall chromatography capability of the system. The chromatogram and analysis parameters are shown in Figure 1.

Using a sample pump to draw air into the system, volatile organic compounds (VOCs) are collected onto a concentrator, analyzed, and quantified using gas chromatography with a Micro Argon Ionization Detector (MAID).



The analytes are drawn into the instrument through the air sampling tube and trapped onto a concentrator.

LOW MAINTENANCE / LOW CONSUMABLE REQUIREMENT

The accompanying documentation allows the end user to easily perform CMS5000 initial installation which includes Argon hook-up, calibration, method set-up and sequenced analysis initiation. End user training is not required for continuous monitoring when utilizing the default methods. An onboard permeation tube is utilized as a check standard, and has a life span of approximately eight years. The Argon consumption is also very low and a 1.6 M external Argon cylinder will last nearly a year, application dependant. Virtually no other maintenance is required.

STABLE OPERATION

A study during an extended period of operation using a CMS5000 with a daily check standard performance verification found very stable retention times. The largest retention time shifts (± 1 second) were found with late eluting compounds. In addition, the CMS5000 peak areas were found to remain stable.

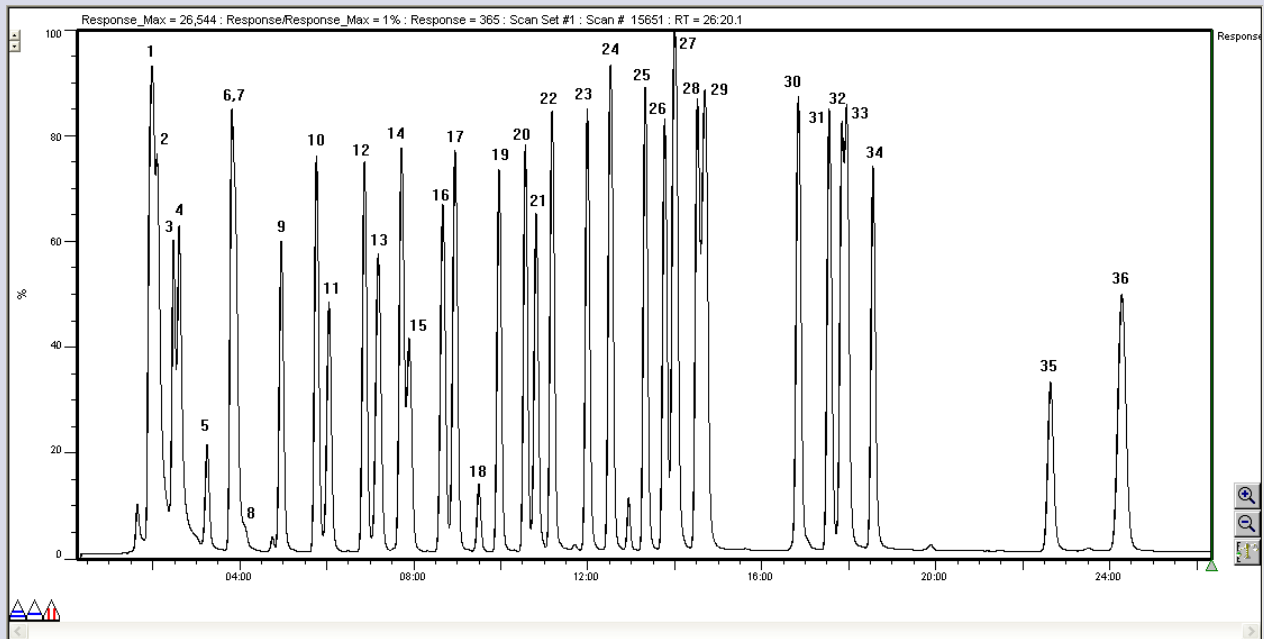
ON-BOARD CALIBRATION

In order to document instrument stability during extended periods of operation, the onboard permeation tube is utilized as a check standard. The software will compensate for normal detector sensitivity fluctuations. Changes in one or more of these parameters may serve as an early warning indicator that preventive maintenance is needed, so that data quality is kept within acceptable limits.

SIMPLE MODIFICATION CONVERTS TO A WATER MONITORING SYSTEM

Through a simple modification of the sampling inlet, the CMS5000 can be used for water analysis. It rapidly analyzes VOCs in water using a modified EPA purge and trap concentrator protocol. The SituProbe purges VOCs from the water and then processes them through the GC. The CMS5000 for water monitoring can detect analytes from PPB to PPT range.

Figure 1: 1 ppm EPA TO-14 Calibration Mix from Air Liquide; ConcFill: 3 sec; Temperature Profile: 55 °C (hold 3 min.) to 90 °C at 6 °C/min, to 140 °C (hold 2 min.) at 12.0 °C/min, to 180 °C at 12 °C /min (hold 8 min)



Components:

- | | | |
|-----------------------------------|-------------------------------|-------------------------------|
| 1. Dichlorotetrafluoroethane | 13. 1,1,1-Trichloroethane | 26. m- and p-Xylene |
| 2. Vinyl Chloride | 14. Benzene | 27. Styrene |
| 3. Bromomethane | 15. Carbon Tetrachloride | 28. 1,1,2,2-Tetrachloroethane |
| 4. Ethyl Chloride | 16. 1,2-Dichloropropane | 29. o-Xylene |
| 5. Trichloromonofluoromethane | 17. Trichloroethylene | 30. 1,2,4-Trimethylbenzene |
| 6. 1,1-Dichloroethene | 18. cis-1,3-Dichloropropene | 31. 1,3,5-Trimethylbenzene |
| 7. Methylene chloride | 19. trans-1,3-Dichloropropene | 32. 1,4-Dichlorobenzene |
| 8. 1,1,2-Trichlorotrifluoroethane | 20. 1,1,2-Trichloroethane | 33. 1,3-Dichlorobenzene |
| 9. 1,1-Dichloroethane | 21. Toluene | 34. 1,2-Dichlorobenzene |
| 10. cis-1,2-Dichloroethylene | 22. 1,2-Dibromoethane | 35. 1,2,4-Trichlorobenzene |
| 11. Chloroform | 23. Tetrachloroethylene | 36. Hexachloro-1,3-butadiene |
| 12. 1,2-Dichloroethane | 24. Chlorobenzene | |
| | 25. Ethylbenzene | |

SPECIFICATIONS

Gas Chromatograph	
GC Column	HP-1, 0.32mm id, 30M, 4.0µm df or equivalent
Valves	Stainless Steel body / Teflon diaphragm
Heated Zones - Maximum Temperature	Three independent heated zones - Column 225 °C - Valves 60 °C - Detector oven 110 °C
Temperature Range	55-200 °C
Carrier Gas	Argon 99.999% @ 414-689 kPa (60-100 psi)
Variable Column Pressure Control	Regulator pre-set to 90 psi
Sample Inlet	Air sampling tube
Concentrator	Tri-Bed
Micro Argon Ionization Detector (MAID)	
Ionization Source	Ni-63 2.4 mCi
Stability	5 runs of 5 ppb Benzene: RSD calculated <15%
Temperature	110 °C Maximum
Computer / Data	Internal Intel® Pentium® processor
Dynamic Range	3 decades
Detection Limit	PPB-PPT for most analytes
Communication	
Integration	TCP/IP based USB for local diagnostics I/O Relay Contacts
FTP	Configurable for automated data upload
Storage	16G Flash Drive
System Status	Status table for system operating changes
Data Results	Text file with compound retention time, quantitation, time/date for all targeted compounds including method parameters, and system status
Wireless Connectivity	802.11 B/G
Touch Screen	6.5" VGA color display with touch screen
Physical Operating Requirements	
Size	16.9" x 32.7" x 10.2" (43 cm x 83 cm x 26 cm)
Weight	55.1 lbs (25 Kg)
Power Requirement	Universal 100-240 V(ac) 400 watts maximum
Operating Temperature	5-45 °C
Analysis & Protocols	
Integrated Performance Standard	Toluene Permeation Tube for check standard calibration
Detectable Compounds	Volatile organic compounds (e.g. halogenated, aliphatic, and aromatic hydrocarbons)
Acceptance Protocol	Initial setup with BTEX standard
Data Analysis	Automatic peak detection and area integration for known compounds

DETECT TO PROTECT™



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Due to our continuing program of product improvements, specifications are subject to change without notice.

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