



CMS5000

Monitoring System

Unattended, On-Site VOC Monitoring

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

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 default methods. The analytical data is representative of actual water conditions at the time of 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 predecessors the CMS100 and CMS200 monitoring systems, an important feature of the CMS5000 is virtually no operator involvement is required following initial installation and setup. Volatile Organic Compounds (VOCs) and Toxic Industrial Chemicals (TICs) in air or water streams are collected and 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 also remotely access the system to view data or select an alternate method. On-site system integration is managed utilizing wireless or Ethernet communication. Analyses are also maintained on the instrument's internal storage as required by the application.

ADVANCED TECHNOLOGY YIELDS QUALITY WATER ANALYSIS

CMS5000 rapidly analyzes VOCs in water using a modified EPA purge and trap concentrator protocol. The state-of-the-art SituProbe™ purges VOCs from water and collects them on a concentrator prior to GC analysis. There is no need for sample pre-treatment or filtration. Since the water condition does not affect the system's performance, even turbid samples can be analyzed with ease. The robust CMS5000 was designed with years of reliable operation in mind. The wall-mounted NEMA-4x

FEATURES AT A GLANCE

- Continuous unattended monitoring using on-board default methods
- Low maintenance
- Robust, reliable design minimizes consumable use
- Minimal training required
- Can be used for air or water monitoring

APPLICATIONS

- Drinking water distribution systems
- Water source and water distribution protection
- Wastewater discharge compliance
- Groundwater remediation
- Air quality monitoring

type enclosure is air and water tight. The front panel screen displays status in real time.

The unique SituProbe purge and trap design facilitates continuous water stream monitoring.



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 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 60 component Restek MegaMix was analyzed on the CMS5000 with column temperature programming to demonstrate the resolution and overall chromatography capability of the system. The chromatogram and analysis parameters are shown in Figure 1.

LOW MAINTENANCE / LOW CONSUMABLE REQUIREMENT

INFICON-trained technicians can 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. Aside from rinsing sediment build up from the water collection vessel, virtually no other maintenance is required.

STABLE OPERATION

An extended run study 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, with CMS5000 peak areas were found to remain stable.

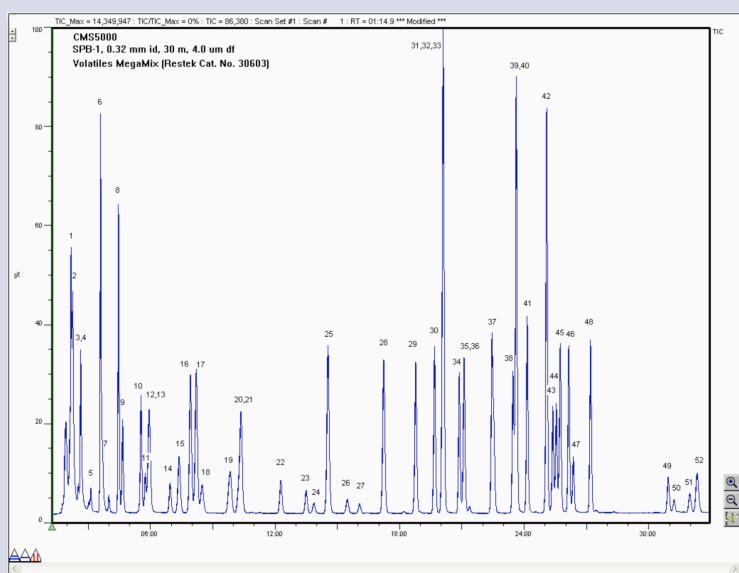
BASED ON US EPA METHODOLOGY

CMS5000 is specifically designed for identification and simultaneous measurement of purgeable volatile organic compounds (VOCs) in finished drinking water, raw source water, or drinking water in any treatment stage. The installed capillary column was selected based on US EPA Method 502.2, and was designed to be application specific for VOC separation based on its unique selectivity for VOC pollutants. As a result, operators have the ability to quantify all compounds listed in the method.

ON-BOARD CALIBRATION

In order to document instrument stability during extended periods of operation lasting weeks or even months, an onboard permeation tube is utilized as a check standard. This long lifespan technology will compensate for seasonal water temperature changes and 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.

The 60 component Restek MegaMix was analyzed on the CMS5000 with column temperature programming to demonstrate the resolution and overall chromatography capability of the system. The chromatogram and analysis parameters are shown below.



- | | |
|------------------------------------|-----------------------------------|
| 1. chloromethane | 32. m-xylene |
| 2. vinyl chloride | 33. bromoform |
| 3. bromomethane | 34. styrene |
| 4. chloroethane | 35. o-xylene |
| 5. trichlorofluoromethane (CFC-11) | 36. 1,1,2,2-tetrachloroethane |
| 6. 1,1-dichloroethane | 37. isopropylbenzene (cumene) |
| 7. methylene chloride | 38. 2-chlorotoluene |
| 8. trans-1,2-dichloroethane | 39. 4-chlorotoluene |
| 9. 1,1-dichloroethane | 40. propylbenzene |
| 10. cis-1,2-dichloroethane | 41. 1,3,5-trimethylbenzene |
| 11. bromochloromethane | 42. 1,2,4-trimethylbenzene |
| 12. chloroform | 43. 1,3-dichlorobenzene |
| 13. 2,2-dichloropropane | 44. 1,4-dichlorobenzene |
| 14. 1,2-dichloroethane | 45. sec-butylbenzene |
| 15. 1,1,1-trichloroethane | 46. 4-isopropyltoluene (p-cymene) |
| 25. toluene | 47. 1,2-dichlorobenzene |
| 26. dibromochloromethane | 48. n-butylbenzene |
| 27. 1,2-dibromoethane (EDB) | 49. 1,2,4-trichlorobenzene |
| 28. tetrachloroethane | 50. naphthalene |
| 29. chlorobenzene | 51. 1,2,3-trichlorobenzene |
| 30. ethylbenzene | 52. hexachloro-1,3-butadiene |
| 31. p-xylene | |

Figure 1 - 1 ppb Restek MegaMix (Cat. #30603) in DI water (25.1°C); ConcFill: 2 min. Temperature Profile: 50°C (hold 8 min.) to 80°C at 4°C/min, to 200°C at 6°C/min (hold 4.5 min.)

SPECIFICATIONS

Gas Chromatograph	
Column	HP-1, 0.32mm id, 30M, 4.0µm df or equivalent
Valves	Stainless Steel body / Teflon diaphragm
Temperature Programmable Column Module	55-200°C
Carrier Gas	Argon 99.999% @ 414-689 kPa (60-100 PSI)
Variable Column Pressure Control	Regulator pre-set to 60 psi
Sample Inlet	Continuous water monitoring SituProbe (dynamic purge & trap) Pre-concentrator (Tri-Bed carbon adsorbent)
Micro Argon Ionization Detector (MAID)	
Sensitivity	0.5ppb Benzene in water, s/n >200:1 0.5ppb MTBE in water, s/n >15:1
Stability	5 runs of 5 ppb Benzene: RSD calculated <15%
Temperature	Maximum 110°C
Computer / Data	Internal Intel® Pentium® processor
Communication	
Integration	TCP/IP based USB for local diagnostics I/O Relay Contacts
FTP	Configurable for automated data upload
Storage	16G Flash (Capacity for >4 years historical data archiving)
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	Data/Status/Method development (18cm diagonal) Status table for system operating changes
Physical Operating Requirements	
Size	43 cm x 83 cm x 26 cm (16.9" x 32.7" x 10.2")
Weight	25 Kg
Power	Universal 100-240 V(ac) 400 watts maximum
Temperature	5°C to 45°C (ambient and water temperature)
Analysis & Protocols	
Integrated Performance Standard	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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