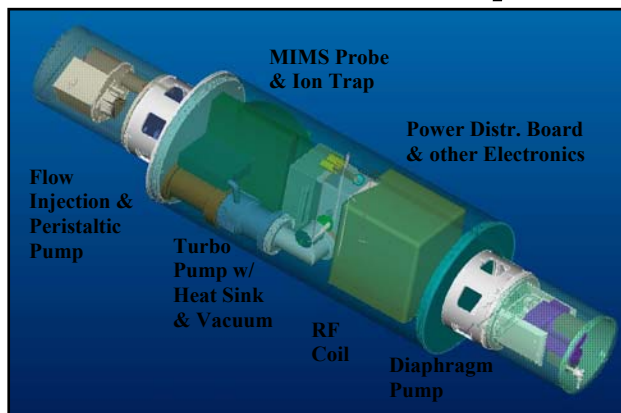


Manta 5 Environmental Mass Spec

A compact high performance EMS



The Manta 5 EMS (Environmental Mass Spectrometer) provides the highest level of performance in a compact, easy-to-use field mass spectrometer system. The Manta 5 can be configured for simple electron ionization operation, or may include the additional problem solving features of MS/MS and Chemical Ionization (CI).

Membrane Interface

The membrane interface is designed to be modular and accept different membranes for different classes of molecular compounds specifically for targeted applications. The membrane with its precise temperature control, uses standard diameter capillary columns. Electronic Flow Control provides pulsed minimized injection and constant flow separation capabilities. With the new higher pressure interface design underway the Manta 5 is the ideal system for high sensitivity in situ routine EMS analysis across many applications.

Data System

All components of the Manta 5 are controlled by a single embedded controller. Manta 5's powerful data system features standard and custom reporting software that utilizes the flexibility of familiar Windows® platforms to meet your ease of use requirements. Custom reporting packages can be made available available for environmental and toxicology applications.

MS Performance

The Manta 5's rugged system requires little operator attention. Without an external ion source, the Manta 5 eliminates the most common MS maintenance task – source cleaning. MS/MS on the Manta 5 is straightforward and a powerful feature. Dramatic sensitivity and selectivity gains for analytes in complex matrices can be achieved routinely.

Vacuum System

The Manta 5 with the V-70 turbomolecular pump and backing fore pump is up and running quickly after routine maintenance. The vacuum pump system in the Manta 5 generates a high efficiency vacuum at the lowest possible cost.

Manta 5 System:

Includes: Membrane Interface Module and Ion Trap Mass Spectrometer with Turbomolecular Pumping System. Embedded PC is also included.

Membrane Interface Module compact column oven temp control (10 C above ambient to 75 C). Injector with type I EFC and stainless steel lines. Supports Rapid-module replacement.

Ion Trap Mass Spectrometer Features: Reliable, simple internal ionization analyzer. Standard EI full scan operation with upgrades to optional Wave-Board Technologies (SIS, PCI, MS/MS). Programmed Acquisition enables embedded PC controlled changes between all modes of operation (EI to CI and MS to MS/MS). Dual filament assembly and clip mounted multiplier. Varian V-70, maintenance free turbo pump. Embedded PC software controls all MS functions and allows fully automated quantitative and qualitative analyses and reporting. Includes standard spectral libraries: TR (Terpenes) with approximately 600 spectra, TX (Toxicology) with approximately 1300 spectra, GP (General Purpose) with about 3,000 spectra. Optional libraries: NIST, Wiley, Pflieger-Maurer-Weber drug and pesticide library or user built libraries.

Embedded Computer

Base: Intel® Core 2 Duo E6600 (Dual Core technology XD), 2.40GHz, 4MB L2 cache, 1066MHz FSB

Memory: 2GB (2 x 1GB) DDR2 Non-ECC SDRAM, 667MHz, (filling 2 of 4 slots)

Network: Integrated Intel NIC (10/100/1000BaseT Ethernet)

Flash Hard Drive: M Module 160GB with 8 MB buffer (NTFS format)

Ports: 1 serial port; 1 parallel port; RJ-45 network port; 4 USB 2.0 ports (2 in front, 6 on rear panel)

Operating System: Microsoft® Windows® XP Professional, SP2

Hardware Support Services: 1 Year Limited Warranty

Resource CD: Resources CD contains Diagnostics and Driver

EI Sensitivity Specification: 1 pg Octafluoronaphthalene (OFN) in isooctane/water injected into a 1 ml sample loop produces a GC peak with a signal-to-noise ratio for m/z 272 of > 20:1 (based on RMS noise) with a library searchable spectrum.

Pressure Vessel:

Aluminum chassis standard for 100 meter applications. Deeper water modules possible for specified applications.

Technical Specifications for the Manta 5 System

The Ion Trap MS system provided has time programmable EI, CI, and MS/MS capabilities. All components of the system are under computer control. The system includes a one-year warranty, parts, labor and travel. All MS and computer hardware to be warranted and serviced by a single vendor to eliminate complicated maintenance and service on the system.

Mass Spectrometer

The minimum performance requirements are: Mass range 10 to 650u programmable throughout the analysis, scan rate of 5600 u/second, and resolution better than unit mass maintained over the entire mass range.

Ionization Modes includes EI, SIS, MS/MS and optimal CI, and CI/MS/MS. The system offers programmable control from one mode of operation to another within a single analysis, without any hardware change, in intervals of 0.01 minutes or less.

The Mass Spectrometer design incorporates the following design features:

Internal Ionization for superior low mass detection

Inert electrodes for optimal separations performance

Manifold heater for independent heating of the membrane to 75°C

The MS includes dual filaments with filament and status under computer control.

The analyzer is removable by the user with simple hand tools in less than 2 minutes after pressure vessel opening.

The MS uses a 70 L/sec Turbomolecular pump. MS analyzer has a prealigned electron multiplier, which may be replaced by the user without the use of any hand tools.

Sensitivity EI: Temperature Programmable Splitless injection of 1 pg. of octafluoronaphthalene in isooctane/water injected into a capillary column produces a peak with a RMS signal to noise for m/z 272 of > 50:1 with a library searchable spectrum.

MS/MS

MS/MS software includes time programmable acquisition segments to allow for changes between EI, CI, MS/MS, and CI/MS/MS in a single analysis. Ion isolation window programmable from 1 to 14 u.

Collision induced Dissociation (CID) through resonant and non-resonant excitation modes. Nonresonant excitation is provided for superior library searchability.

Software includes multiple reaction monitoring (MRM), capable of simultaneous monitoring up to ten parent ions and resulting progeny ions, or quantitation of four parent ions and resulting progeny ions.

Also provided is GLP record of all MS/MS acquisition parameters within the log file, and appended to the data file. Software has the ability to perform automated method development (ADM) for rapid determination of optimum MS/MS conditions.

Sensitivity: Splitless injection of 1 pg benzophenone gives a peak with a signal to noise > 10:1 for m/z 152 when selecting m/z 182 as the parent ion.

Selected Ion Storage (SIS)

The MS includes Selected Ion Storage capable of simultaneous storage of 3 ions or ranges of ions while excluding up to 5 interfering ions. SIS ions are time programmable in 0.01-minute increments, over a mass range of 35 to 650u.

SIS results are library searchable against standard libraries such as NIST using only the NIST library ions as specified in the SIS method.

Sensitivity: Splitless injection of 500 fg Tetrachlorobenzene injected with an acquisition range of 175u-225u, must produce a signal to noise > 10:1 for either m/z 214, 216, or 214 + 216. The spectrum must be library searchable.

Chemical Ionization (future option)

EI to CI change is completely controlled through software. No hardware changes or down time. Changeover between EI and CI is possible in less than 5 seconds during a injection run, as well as between injections. Chemical Ionization is allow for either gas (including methane, isobutane, and ammonia) or liquid (including methanol, acetonitrile, and toluene) CI reagents. CI introduction will be controlled through a flow diversion system with gas saver.

CI gas manifold (optional) can automate detection of analytes by EI and up to three different CI reagents for easy method development and optimization.

Sensitivity, Methane CI: injection of 5 pg of benzophenone in methanol into a capillary column produces a peak with a signal to noise ratio > 20:1 for the protonated molecule at m/z 183.

