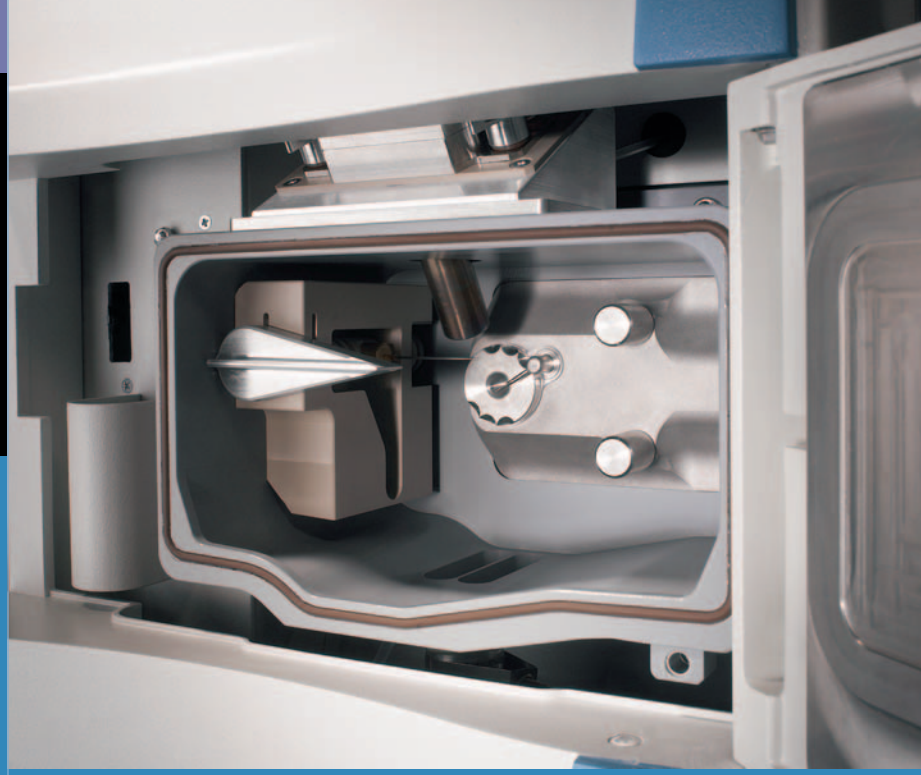
Thermo Scientific MSQ Plus Mass Detector



Advanced Detection for Liquid Chromatography

Part of Thermo Fisher Scientific

Thermo SCIENTIFIC

Mass Detection Made Simple

The world's smallest mass spectrometer, the Thermo Scientific MSQ Plus Mass Detector, provides unsurpassed performance and ruggedness in an easy-to-use, highly sensitive instrument.

Today's laboratory environment requires instrumentation that will operate unattended, while delivering fast, reliable results. The market's smallest and most powerful single quadrupole mass spectrometer, the MSQ™ Plus Mass Detector, extends detection sensitivity beyond any liquid chromatography (LC) detector. Designed to work unattended, it enables accelerated productivity when partnered with the revolutionary Thermo Scientific Accela LC system.

At a mere thirty centimeters wide, the MSQ Plus Mass Detector is the smallest single quadrupole mass spectrometer (MS) available for LC; and, its required bench space is less than any other system on the market. When combined with Accela™, the ultra-compact mass detector incorporates the latest cutting edge technology and innovative design, producing unsurpassed performance and ruggedness in an easy-to-use, highly sensitive instrument.

The MSQ Plus Mass Detector is complemented with the Thermo Scientific Xcalibur Data System, for unsurpassed ease of use and comprehensive instrument control, data analysis and reporting. Xcalibur™ software addresses data processing requirements ranging from regulatory compliance (21 CFR Part 11), data reporting, quantitation, large and small molecule applications for all users.

The new Accela High Speed LC System uses 1.9 µm column particle technology to achieve high speed, efficient chromatographic separations at conventional LC pressures and up to 15,000 psi.

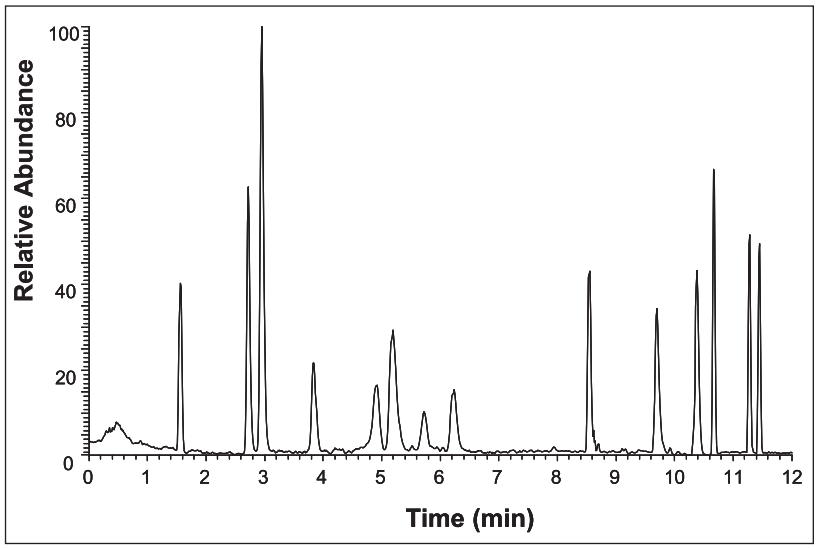
Run Routine Applications More Efficiently

The MSQ Plus Mass Detector helps chromatographers run routine LC applications more efficiently. The mass detector provides an excellent platform for sample analysis by offering a quick and clear mass identification for chromatographic peaks.

Mass detection adds additional confidence to your quantitation, enabling you to obtain limits of detection which can be up to 1000 times greater than UV detection. It eliminates the challenges facing the chromatographer using UV detection by:

- Reducing time limitations
- Increasing sensitivity
- Identifying chromatogram peaks with confidence
- Indicating whether any peaks in a chromatogram have co-eluted

Unknown chromatographic peaks can appear during the development and manufacturing of drugs, chemicals, and natural products. Mass detection enables the chromatographer to quickly and effectively suggest a number of possibilities for these unknown peaks. By scanning across a peak, it is possible to detect the appearance of unusual masses. The example below clearly illustrates two compounds co-eluting. By overlaying the individual responses for each recorded mass, it is possible to determine how the compounds contribute to the total chromatographic peak.



Robust and reproducible data – day-in and day-out

Cutting-edge Technology and Innovative Design

Versatile

Chromatographers do not need to compromise their chromatography in order to gain specific data, because the MSQ Plus Mass Detector integrates seamlessly with an LC system. Robust performance is achieved routinely, even with applications involving ion-pairing reagents, non-volatile buffers and complex sample matrices. It is the ideal detector for the widest range of applications, spanning both conventional and ultra high performance LC, easily handling eluents from both microbore and conventional columns.

Fast Scan Speed

Scan speeds of 12,000 amu/sec allow more scan events and data collection in less time.

Wide Range of Flow Rates

The MSQ Plus Mass Detector handles 10 µL/min to 2 mL/min in electrospray ionization (ESI) and 0.2 to 2 mL/min in atmospheric chemical ionization (APCI).

Multi-Vendor Support

The MSQ Plus Mass Detector seamlessly interfaces with the Accela LC system, as well as many third-party instruments. The cross-platform software suite allows the Xcalibur Data System to directly control these instruments, eliminating the use of multiple programs and computers.

FastLoc Probes

FastLoc Probes eliminate complex gas and high voltage connections, enabling easy switching of ionization modes

RF/DC Prefilter

The square quadrupole RF/DC prefilter increases ion transmission efficiency and protects the analyzing quadrupole

M-Path Source Design

Patented M-Path sampling system enables extreme sensitivity from real samples

Cone Wash

Patented Cone Wash accommodates dirty samples and salt buffers

Autocalibration System

Automatic mass scale calibration and tuning increases confidence and simplifies use

Ion Bright Detector

Patented Ion Bright™ Detector generates the greatest signal with the least noise

Advanced Quantitation and Simple Set-up

As a Quantitative Tool

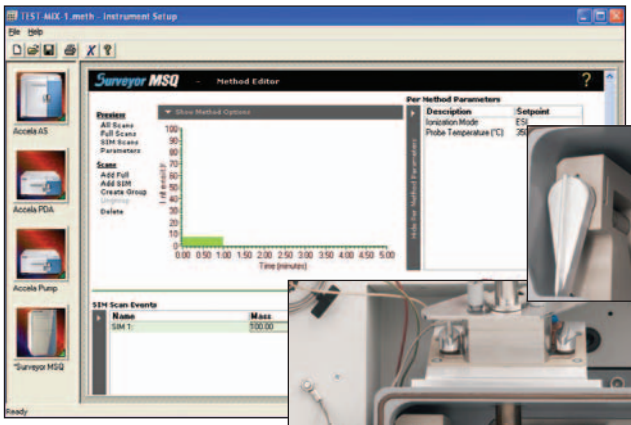
The cost-effective MSQ Plus Mass Detector is designed to provide accurate mass information about specific analytes without the need to be an expert in the details of mass spectrometry.

Simple Set-up

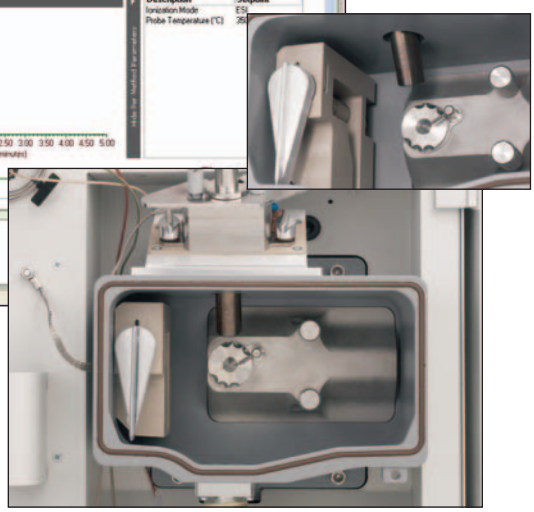
ESI and APCI FastLoc Probes enable quick and simple mode change, while the wipe-clean, tool-free maintenance M-Path source with patented cone wash provides ultra-rugged performance.

Simple interactive method set-up and point-and-click sequences are available from built-in templates.

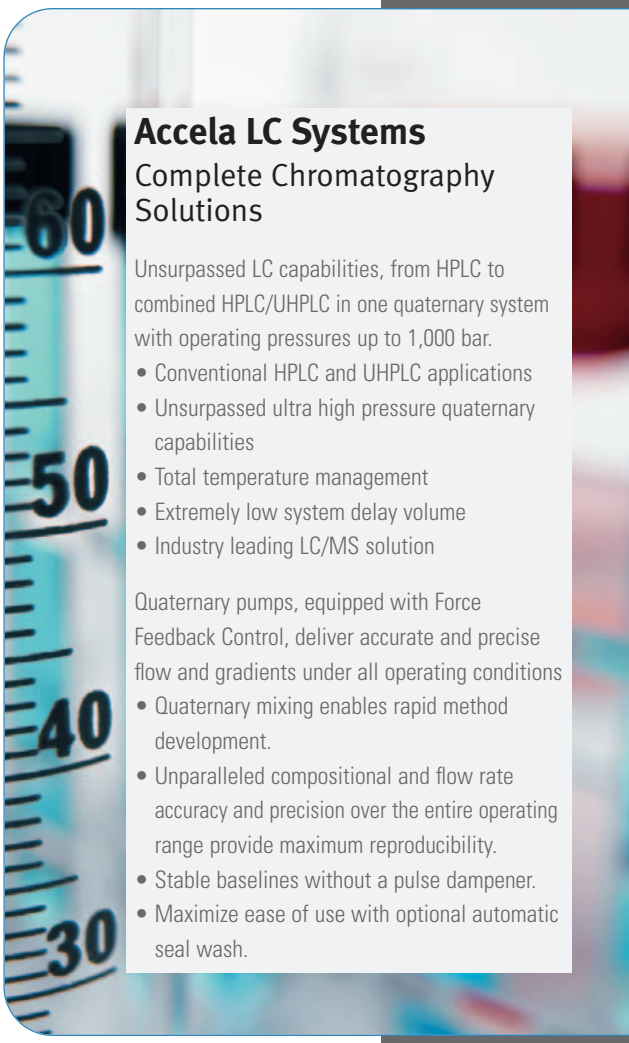
Automated instrument set-up requires no user input and has built-in automatic mass scale calibration, along with automatic full system Autotune that completes all required tasks.



FastLoc Probes enable quick and simple mode changes



Wipe-clean, tool-free maintenance source



Accela LC Systems

Complete Chromatography Solutions

Unsurpassed LC capabilities, from HPLC to combined HPLC/UHPLC in one quaternary system with operating pressures up to 1,000 bar.

- Conventional HPLC and UHPLC applications
- Unsurpassed ultra high pressure quaternary capabilities
- Total temperature management
- Extremely low system delay volume
- Industry leading LC/MS solution

Quaternary pumps, equipped with Force Feedback Control, deliver accurate and precise flow and gradients under all operating conditions

- Quaternary mixing enables rapid method development.
- Unparalleled compositional and flow rate accuracy and precision over the entire operating range provide maximum reproducibility.
- Stable baselines without a pulse dampener.
- Maximize ease of use with optional automatic seal wash.

Performance and Ease-of-Use

API

Atmospheric Pressure Ionization is the most universal interface for liquid chromatography with mass detection. With the MSQ Plus Mass Detector, switching between two API modes is quick and easy:

- ESI provides a rapid, accurate means of analyzing a wide range of polar molecules and can generate multiply charged ions, allowing large bio-molecules to be detected.
- APCI is ideal for identifying and quantifying a wide range of small organic molecules including many drugs, pollutants, and chemical intermediates.

Speed

The MSQ Plus Mass Detector has a Dual DSP acquisition system that easily handles the fast scanning required for narrow ultra high performance LC peaks. With a scan rate capability of over 12,000 amu per second, more points across your peaks can be acquired to produce better:

- Detection limits
- Resolution of close eluting peaks
- Spectral integrity and accuracy
- Quantitation and better throughput

Excellent Data Quality and Accuracy

Sensitivity

The advanced technology of the MSQ Plus Mass Detector brings industry-leading sensitivity to the smallest LC/MS detector available. The mass detector gives the chromatographer unique flexibility in a wide range of applications. Conventional MS sources are not robust enough to maintain performance for long periods of time in the presence of complex sample matrices or nonvolatile buffers.

Compliance

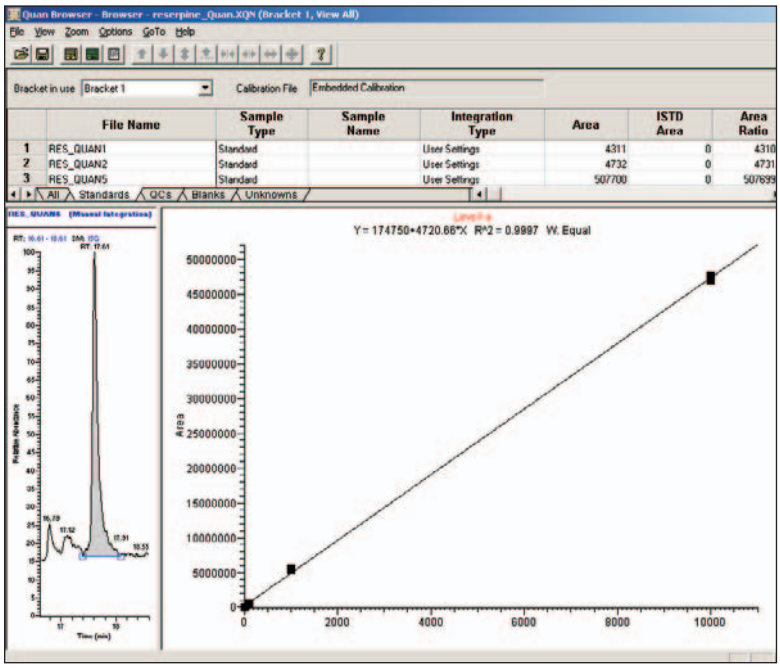
Secure system access, multiple user security, data file integrity, built-in audit trails, electronic signoff and review and more are provided in the new Xcalibur Data System with software control of the MSQ Plus Mass Detector. Users can be assigned into groups with various software rights and privileges for total and secure control of the MSQ Plus Mass Detector. Regulated laboratory operations can easily operate the MSQ Plus Mass Detector in this environment to address 21 CFR Part 11 issues.

Robustness

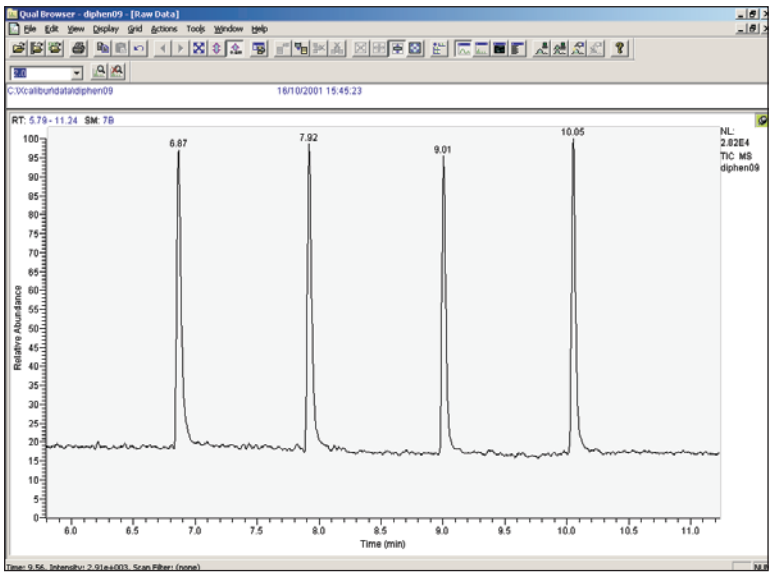
Unlike other instruments, the MSQ Plus Mass Detector features unique patented Cone Wash which maintains instrument performance under the most rigorous conditions, reducing the amount of cleanup typical with chromatographic methods that use mass detection. Whether it is high concentration, salts, or dirty sample matrices, the MSQ Plus Mass Detector delivers non-stop quality results.

Dynamic Range

The MSQ Plus Mass Detector has ten times the sensitivity of previous instruments. This, combined with the RF/DC Prefilter and detector system, has produced an instrument with over four orders of dynamic range.



Reserpine 1 pg – 10 ng demonstrating four orders of dynamics range and excellent linearity.



Four 1 pg injections of diphenhydramine demonstrating the superb sensitivity of MSQ Plus Mass Detector in excess of 250:1 RMS.

More Reliable Drug Development

Screening the Fast Way

Increase the Speed and Reliability of Your Drug Discovery

Analytical LC methods can be developed faster with reduced run times by combining the sensitivity of the MSQ Plus Mass Detector with the selectivity of your LC method. Overlapping peaks detected by UV or other detectors can be fully resolved using the MSQ Plus Mass Detector, resulting in better quantitation and total confidence in assigning peak identity. Lead optimization is made faster by utilizing the power of the mass detector to confirm the structural identity of hits following high-throughput screening, increasing the reliability of your drug development.

Rapid, quantitative LC methods are ideal for investigating metabolism and stability of compounds in preclinical and clinical development.

The wide linear range, sensitivity, and selectivity of the MSQ Plus Mass Detector makes it the ideal choice for pharmacokinetic assays. The robust quadrupole detector gives the accurate quantitation that is needed for QC. Its ability to rapidly generate an interpret 'fingerprints' provides the necessary data to confirm peak purity or compare product batches.

In addition to these offices, Thermo Fisher Scientific maintains a network of representative organizations throughout the world.

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