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Waters Xevo TQ MS Performance Specifications

The Waters® Xevo™ TQ Mass Spectrometer is an advanced, bench top, tandem quadrupole mass spectrometer designed for ultra high performance LC/MS /MS applications. Unlike conventional tandem quadrupole mass spectrometers, the Xevo TQ MS utilizes unique T-Wave™1 and ScanWave™ enabled collision cell technology to provide a highly flexible analytical tool capable of supporting both quantitative and qualitative studies on a single MS platform. The Xevo TQ MS is a robust platform for quantitative LC/MS /MS, featuring high speed MRM (Multiple Reaction Monitoring), with enhanced full scan spectral acquisition modes providing additional qualitative LC/MS /MS capabilities.

The system incorporates IntelliStart™ Technology, for automated system optimization and status monitoring, ensuring that the highest quality data is routinely available to all levels of operator.

System Hardware Specifications

API sources and ionization modes: High performance ZSpray™ dual-orthogonal API sources

- 1) Multi mode source: ESI/APCI/ESCI® (standard), NB: Dedicated APCI requires an additional probe (opt).
- 2) Dual mode APPI/APCI source (optional)
- 3) Nano-flow ESI source (optional)
- 4) Atmospheric pressure solids analysis probe - ASAP (optional)
- 5) Atmospheric pressure gas chromatography ion source - APGC (optional)
 - Optimized gas flow dynamics for efficient ESI desolvation (supporting LC flow rates up to 2 mL/min)
 - Tool-free source exchange
 - Vacuum isolation valve
 - Tool free access to customer serviceable elements
 - Plug and play probes
 - De-clustering cone gas
 - Software control of gas flows and heating elements

Ion source transfer optics: High efficiency hexapole ion guide

Mass analyzer: Two high resolution quadrupole analyzers (MS1/MS2), plus pre-filters to maximize resolution and transmission while preventing contamination of the main analyzers

Collision cell: T-Wave enabled for optimal MS/MS performance at high data acquisition rates; ScanWave enabled for enhanced MS/MS spectral performance (product ion scanning); Software programmable gas control

Detector: Low noise, off axis, long life photomultiplier detector; Digital dynamic range up to 4×10^6

Vacuum system: Two air-cooled vacuum turbomolecular pumps evacuating the source and analyzer; One rotary backing pump

Dimensions: Width: 61.0 cm (24.0 in.), Height: 70.7 cm (27.8 in.), Depth: 90.4 cm (35.6 in.)

Regulatory approvals: IVD, CE, and NRTL

System Software Specifications

Software: Systems supported on MassLynx™ version 4.1 or later; OpenLynx™ and TargetLynx™ Application Managers are included as standard. The following MassLynx Quantification Work-flow Tools are also included as standard.

IntelliStart Technology: System parameter checking and alerts, Integrated sample/calibrant delivery system + programmable divert valve, Automated mass calibration, Automated sample tuning, Automated SIR and MRM method development; LC/MS System Check – automated on-column performance test.

Quantification methods database: Quanpedia™ – a data base for storing and sharing user defined LC/MRM acquisition methods and associated processing methods for the targeted quantification of named compounds is provided as standard; database entries (greater than 1000 compounds) for a number of applications are also provided as a standard.

Auto-Dwell feature for MRM acquisition rate assignment: Dwell time, inter-channel delay time, and inter-scan delay time for individual channels in a Multiple MRM experiment can be automatically assigned (using the Auto-Dwell feature) to ensure that the optimal number of MRM data points per chromatographic peak is acquired. The Auto-Dwell feature can dynamically optimize MRM cycle times to accommodate retention time windows that either partially or completely overlap. This greatly simplifies MRM method creation, irrespective of the number of compounds in a single assay, while at the same time ensuring the very best quantitative performance for every experiment.

MRM acquisition window assignment: Multiple MRM experiments can be scheduled (manually or automatically using the Quanpedia database) using retention time windows to optimize the cycle time for each MRM channel monitored. If required, MRM retention time windows can overlap partially or completely. This ensures that MRM data acquisition rates will be optimal for the quantification of all analytes in a given assay.

Performance Specifications

Acquisition modes:

- Full scan MS
- Product ion scan (ScanWave enhanced)
- Precursor ion scan
- Constant neutral loss
- Selected ion recording (SIR)
- Multiple reaction monitoring (MRM)

Survey scan modes:

- Full scan MS triggered product ion scan
- Precursor ion scan triggered product ion scan
- Constant neutral loss triggered product ion scan

Quan Qual mode: MRM triggered ScanWave enhanced product ion spectral acquisition

Mass range: 2 to 2048 m/z

Scan speed: Up to 10,000 Da/s; Examples of achievable acquisition rates:

- 10 scans per second (m/z 100 to 1000)
- 20 scans per second (m/z 50 to 500)

Mass stability: Mass drift is less than 0.1 amu over a 24 hour period

Linearity of response: The linearity of response relative to sample concentration, for a specified compound, is five orders of magnitude from the limit of detection.

Instrument Specifications

Polarity switching time: 20 ms to switch between positive and negative ion modes

MS to MS/MS switching time: 5 ms

ESCI mode switching time: 20 ms to switch between ESI and APCI

MRM acquisition rate: Minimum dwell time of 1 ms per MRM channel

Inter-channel cross talk: The inter-channel cross talk between two MRM transitions, acquired using an MRM dwell time of 10 ms and an inter-channel delay time of 10 ms, will be less than 0.02%

Number of MRM channels: Up to 16,384 MRM channels (512 functions, 32 channels per function) can be monitored in a single acquisition; up to 1024 MRM channels when operating in GLP/secure mode (32 functions, 32 channels per function)

Mass resolution: Automatically adjusted (IntelliStart) to desired resolution; (0.40 Da, 0.75 Da or 1.00 Da FWHM)

MRM sensitivity (ESI+): A 50 fg on-column injection of reserpine will give a chromatographic signal-to-noise greater than 500:1 (Gradient separation, LC mobile phase flow rate of 0.8 mL/min, MRM transition m/z 609 > 195)

MRM sensitivity (ESI-): A 1 pg on-column injection of chloramphenicol will give a chromatographic signal-to-noise greater than 1,000:1 (Gradient separation, LC mobile phase flow rate of 0.8 mL/min, MRM transition m/z 321 > 152)

MRM sensitivity (APCI+): A 10 pg on-column injection of 17- α -hydroxyprogesterone will give a chromatographic signal-to-noise greater than 100:1 (Gradient separation, LC mobile phase flow rate of 0.8 mL/min, MRM transition m/z 331 > 109)

It should be noted that the above are not standard installation specifications. See Site Preparation Guide and Product Release Notes for additional product and specification information.



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