**Xevo TQ-S**

Xevo® TQ-S is an advanced benchtop tandem quadrupole mass spectrometer, designed to meet the needs of your most demanding quantitative LC-MS/MS applications. Xevo TQ-S features revolutionary off-axis StepWave™ ion transfer optics that dramatically increases the efficiency of ion transfer from the ion source to the quadrupole MS analyzer at the same time as actively eliminating undesirable neutral contaminants.

Xevo TQ-S also features ScanWave™ collision cell technology to provide the very best high-speed MRM, an enhanced product ion spectral acquisition capability and a valuable, information-rich acquisition mode known as RADAR.™ 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 (optional)
  2. APCI IonSABRE II probe (optional)
  3. Dual mode APPI/APCI source (optional)
  4. nanoFlow ESI source (optional)
  5. ASAP (optional)
  6. APGC ion source (optional)
  7. ionKey™ source (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 user serviceable elements
- Plug-and-play probes
- De-clustering cone gas
- Software control of gas flows and heating elements

**Ion source transfer optics**

- StepWave ion transfer optics delivering class leading UPLC/MS/MS sensitivity. The unique off-axis design dramatically increases the efficiency of ion transfer from the ion source to the quadrupole MS analyser at the same time as actively eliminating undesirable neutral contaminants.

**Mass analyzer**

- Two high-resolution, high-stability quadrupole analyzers (MS1/MS2), plus pre-filters to maximize resolution and transmission while preventing contamination of the main analyzers.
### INSTRUMENT SPECIFICATIONS

<table>
<thead>
<tr>
<th><strong>Collision cell</strong></th>
<th>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</th>
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</thead>
<tbody>
<tr>
<td><strong>Detector</strong></td>
<td>Low-noise, off-axis, long-life photomultiplier detector</td>
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<tr>
<td><strong>Vacuum system</strong></td>
<td>Three air-cooled turbomolecular vacuum pumps; Two vacuum backing pumps</td>
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</tbody>
</table>
| **Dimensions**     | Width: 61.0 cm (24.0 in.)  
Height: 70.7 cm (27.8 in.)  
Depth: 99.5 cm (39.0 in.)  |
| **Regulatory approvals/marks** | CE, CB, NRTL (CAN/US), RCM  |

### SYSTEM SOFTWARE SPECIFICATIONS

<table>
<thead>
<tr>
<th><strong>Software</strong></th>
<th>Systems supported on MassLynx® version 4.1 or later; OpenLynx™ and TargetLynx™ XS Application Managers are included as standard</th>
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</thead>
</table>
| **IntelliStart Technology** | System parameter checks and alerts  
Integrated sample/calibrant delivery system + programmable divert valve  
Automated mass calibration  
Automated sample tuning  
Automated SIR and MRM method development  
UPLC/MS/MS System Check – automated on-column performance test |
| **Automated MRM scheduling** | 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 are acquired. The Auto-Dwell feature dynamically optimizes MRM cycle times to accommodate retention time windows that 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 |
| **Automated MRM scheduling** | 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, ensuring 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 scan  
|                   | Selected ion recording (SIR)  
|                   | Multiple reaction monitoring (MRM)  
|                   | Simultaneous Full scan and MRM (RADAR)  
| Survey scan modes | Full scan MS data acts as an automatic trigger for the collection of ScanWave-enhanced product ion spectra  
|                   | Precursor ion scan data acts as an automatic trigger for the collection of ScanWave-enhanced product ion spectra  
|                   | Constant neutral scan data acts as an automatic trigger for the collection of ScanWave-enhanced product ion spectra  
| Product ion confirmation (PIC) mode | MRM data acts as an automatic trigger for the collection of ScanWave-enhanced product ion spectra  
| RADAR | An information rich acquisition approach that allows you to collect highly specific quantitative data for target compounds while providing the ability to visualize all other components  
| Mass range | 2 to 2048 \( m/z \)  
| Scan speed | Up to 10,000 Da/s  
|           | Examples of achievable acquisition rates:  
|           | 10 scans per second (\( m/z \) 50 to 1000)  
|           | 20 scans per second (\( m/z \) 50 to 500)  
| Mass stability | Mass assignment will be within +/- 0.05 Da over a 24 hour period (the instrument must be operated in conformance with the laboratory environmental guidelines given in the Xevo TQ-S site preparation guide)  
| 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  
| Polarity switching time | 20 ms to switch between positive and negative ion modes  
| MS to MS/MS switching time | 3 ms  
| ESCi mode switching time | 20 ms to switch between ESI and APCI  
| MRM acquisition rate | Maximum acquisition rate of 250 MRM data points per second;  
|                       | Minimum dwell time of 1 ms per MRM channel;  
|                       | Minimum inter-channel delay of 3 ms  
| Inter-channel cross talk | The inter-channel cross talk between two MRM transitions, acquired using an MRM dwell time of 1 ms and an inter-channel delay time of 3 ms, is less than 0.01%  
| 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 8,000 MRM channels when operating in GLP/secure mode (250 functions, 32 channels per function)  

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Xevo TQ-S Instrument Specifications
<table>
<thead>
<tr>
<th>Specifications</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Mass resolution</td>
<td>Automatically adjusted (IntelliStart) to desired resolution; the valley between the m/z 2034.63 and m/z2035.63 peaks is &lt;12% of the average height of the two peaks</td>
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<tr>
<td>MRM sensitivity (ESI+)</td>
<td>A 1 pg on-column injection of reserpine will give a chromatographic signal-to-noise greater than 300,000:1, using raw unsmoothed data (Gradient separation, LC mobile phase flow rate of 0.8 mL/min, MRM transition m/z 609 &gt; 195)</td>
</tr>
<tr>
<td>MRM sensitivity (ESI+)</td>
<td>A 1 fg on-column injection of Midazolam onto a 150 µm chromatographic separation device will give a chromatographic signal to noise greater than 250:1, using raw unsmoothed data (Gradient separation, LC mobile phase flow rate of 2 µL/min, MRM transition m/z 326 &gt; 291)</td>
</tr>
<tr>
<td>MRM sensitivity (ESI-)</td>
<td>A 1 pg on-column injection of chloramphenicol will give a chromatographic signal-to-noise greater than 200,000:1, using raw unsmoothed data (Gradient separation, LC mobile phase flow rate of 0.8 mL/min, MRM transition m/z 321 &gt; 152)</td>
</tr>
<tr>
<td>MRM sensitivity (APCI+)</td>
<td>A 1 pg on-column injection of 17-α-hydroxyprogesterone will give a chromatographic signal-to-noise greater than 100:1, using raw unsmoothed data (Gradient separation, LC mobile phase flow rate of 0.8 mL/min, MRM transition m/z 331 &gt; 109)</td>
</tr>
<tr>
<td>MRM sensitivity (GC/MS)</td>
<td>A 100 fg on-column injection of Octafluoronaphthalene will give a chromatographic signal to noise greater than 4500:1, using raw unsmoothed data (1 µL Splitless injection, Helium flow rate of 2 ml/min, MRM transition m/z 272 &gt; 241)</td>
</tr>
</tbody>
</table>

It should be noted that the above are not standard installation specifications. All Xevo TQ-S instruments will be installed and tested in accordance with standard performance tests as detailed in Waters document (715002460, Xevo TQ-S Installation Checklist). Performance specifications given in this document and installation test criteria are routinely reviewed to ensure quality is maintained and are therefore subject to change without notice. See Site Preparation Guide and Product Release Notes for additional product and specification information.

For patent information, please see [www.waters.com/patents](http://www.waters.com/patents)