

SQ Detector 2

The Waters™ SQ Detector 2 is an advanced bench top single quadrupole mass detector designed for high performance LC-MS applications. With a wide range of ionization options including Atmospheric Pressure Photo Ionization (APPI) and the Atmospheric Solids Analysis Probe (ASAP), the SQ Detector 2 is ideally suited to a wide range of qualitative and quantitative applications.

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



SYSTEM HARDWARE SPECIFICATIONS

API Sources and ionization modes	<p>High performance ZSpray™ dual-orthogonal API sources:</p> <ol style="list-style-type: none"> 1) Multimode source – ESI/APCI/ESCi™ (standard) NB – Dedicated APCI requires an additional probe (optional) 2) Dedicated APCI (optional) 3) Dual mode APPI/APCI* source (optional) 4) Atmospheric Solids Analysis Probe (ASAP) (optional) <p>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</p>
Ion source transfer optics	High efficiency stacked ring ion guide
Mass analyzer	Single high resolution quadrupole analyzer, plus pre-filter to maximize resolution and transmission while preventing contamination of the main analyzer
Detector	Low noise, off axis, long life photomultiplier detector Digital dynamic range up to 4×10^6
Vacuum system	<p>Single, split-flow air-cooled vacuum turbomolecular pump evacuating the source and analyzer</p> <p>One rotary backing pump</p>

Dimensions	Width: 36.0 cm (14.2 in.)
	Height: 59.3 cm (23.4 in.)
	Depth: 74.1 cm (29.2 in.)
Regulatory approvals/marks	CE, CB, NRTL (CAN/US), RCM

SYSTEM SOFTWARE SPECIFICATIONS

Software	Systems supported on MassLynx™ 4.1 and Empower 3 (and later versions)
IntelliStart Technology	<p>System parameter checks and alerts</p> <p>Integrated sample/calibrant delivery system + programmable divert valve</p> <p>Automated mass calibration</p> <p>Automated sample tuning</p> <p>Automated SIR method development</p> <p>LC-MS system check – automated on-column performance test</p>
Automated SIR scheduling* (acquisition rate assignment)	Dwell time, inter-channel delay time, and inter-scan delay time for individual channels in a multiple SIR experiment can be automatically assigned (using the Auto-Dwell feature) to ensure that the optimal number of SIR data points per chromatographic peak is acquired. The Auto-Dwell feature can dynamically optimize SIR cycle times to accommodate retention time windows that either partially or completely overlap. This greatly simplifies SIR 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 SIR scheduling* (acquisition window assignment)	Multiple SIR experiments can be scheduled (manually or automatically using the Quanpedia™ database) using retention time windows to optimize the cycle time for each SIR channel monitored. If required, SIR retention time windows can overlap partially or completely. This ensures that SIR data acquisition rates will be optimal for the quantification of all analytes in a given assay.

PERFORMANCE SPECIFICATIONS

Acquisition modes	<p>Full scan MS</p> <p>Selected Ion Recording (SIR)</p>
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 3072 <i>m/z</i>
Scan speed	<p>Up to 15,000 Da/s</p> <p>Examples of achievable acquisition rates:</p> <p>15 scans per second (<i>m/z</i> 100 to 1000)</p> <p>30 scans per second (<i>m/z</i> 50 to 500)</p>
Mass stability	Mass drift is less than 0.1 Da over a 24 hour period
Linearity of response	The linearity of response relative to sample concentration, for a specified compound, is four orders of magnitude from the limit of detection

Polarity switching time	20 ms to switch between positive and negative ion modes
ESCI mode switching time	20 ms to switch between ESI and APCI
SIR acquisition rate	Minimum dwell time of 3 ms per SIR channel; Minimum inter-channel delay of 3 ms
Number of SIR channels**	Up to 16,384 SIR channels (512 functions, 32 channels per function) can be monitored in a single acquisition; up to 1024 SIR channels when operating in GLP/secure mode (32 functions, 32 channels per function)
Mass resolution	Automatically adjusted (IntelliStart) to desired resolution
SIR sensitivity (ESI+)	A 1 pg on column injection (5 μ L of 0.2 pg/ μ L) of reserpine, with a mobile phase flow rate of 400 μ L/min will give a chromatographic signal-to-noise for m/z 609 greater than 150:1
SIR sensitivity (APCI+)	A 1 pg loop injection (5 μ L of 0.2 pg/ μ L) of reserpine, with a mobile phase flow rate of 1000 μ L/min will give a chromatographic signal-to-noise for m/z 609 greater than 120:1
SIR signal-to-noise definition	Signal is defined as the height of the chromatographic peak of interest and noise is defined as the RMS of a continuous section of the mass chromatogram

It should be noted that the above are not standard installation specifications. All SQ Detector 2 instruments will be installed and tested in accordance with standard performance tests as detailed in Waters SQ Detector 2 Installation Checklist. 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.

* Feature is only available on systems controlled by MassLynx 4.1.

** 512 Function operation is only available with systems controlled by MassLynx 4.1. Empower 3 controlled systems monitor a maximum of 1024 SIR channels (32 function, 32 channels per function).

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