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TQ Detector

Waters

NEXT-GENERATION LC/MS/MS FOR UNPRECEDENTED PRODUCTIVITY AND EASE.

THE SCIENCE OF WHAT'S POSSIBLE.

RAPID QUANTITATION WITH UPLC/MS/MS. Maximize throughput and minimize downtime with the ACQUITY TQD.

At Waters, the leader in innovations for chromatography and mass spectrometry, we know you are challenged every day to get more information from your analytical data; to maximize throughput and minimize downtime. = Our next generation of ACQUITY® mass spectrometric detection leverages the power of UltraPerformance LC® to give you the high-quality analytical information you need — without complicated operation, time-consuming troubleshooting and upkeep, or bulky instrumentation. = The Waters® ACQUITY TQD offers a simple LC/MS/MS system solution for fast-paced, multi-user laboratory environments. = You can rely on robust and reliable performance as well as walk-up operation for any level of expertise. = You get superior quantitative results, quickly and easily, every time. = All from the solutions provider you know and trust.



MS/MS FOR THE MASSES

As analyzing pharmaceutical, food, clinical, chemical, and environmental samples becomes more challenging, matrices become more complex. Concentration levels widen and high throughput becomes the norm; LC/MS detection techniques are becoming increasingly inefficient.

Liquid chromatography, when combined with tandem quadrupole mass spectrometry (LC/MS/MS), allows you to obtain accurate quantitative information that increases confidence in your results. With the ACQUITY TQD, you can vastly expand the scope of your analytical capabilities – all with enhanced selectivity, sensitivity, and linearity. With the power of analytical information, you are able to quickly and easily quantify and confirm trace components in complex matrices with speed and accuracy.



Multiple Reaction Monitoring (MRM) with the ACQUITY TQD adds selectivity to quantitative analyses in complex matrices, lowering LoQs.

UPLC/MS/MS – MAXIMIZE PRODUCTIVITY

The ACQUITY TQD delivers comprehensive, system-level productivity. The TQ Detector's fast acquisition capabilities are complemented by a full suite of ACQUITY UPLC technologies – hardware, software, columns, and chemistries – designed to work together to give you more than you've ever experienced from traditional LC/MS/MS systems. UPLC[®] employs novel small column particles, very low system volumes, and greater throughput to detect more peaks in faster runs – adding significant value to the power of the high-speed TQ Detector.

The results are narrow UPLC peaks and superb spectral quality for easy identification of all of the compounds in your sample. The detector is additionally able to cycle through ESCi®-enabled multiple ionization modes (ESI and APCI) and any combination of full scan, MRM, polarity switching, and T-Wave^{™1} enabled high-speed MS/MS. With these all occurring within rapid UPLC run-time windows, the ACQUITY TQD is a highly efficient UPLC/MS/MS platform that is adaptable to a variety of applications. Your lab benefits with the ultimate in productivity and flexibility.

Multi-Mode Ionization

Collect APCI and ESI data in the same run using the ESCi multi-mode ionization source. Rapid polarity switching further enhances your system's versatility. Discrete data channels are recorded for each mode, enabling optimized method development and screening of multiple compound classes.



High-Speed Quantitation

Accurate quantitation of the narrow peaks widths typical of UPLC (two to three seconds) demands fast acquisition speeds to provide sufficient data points per peak. The use of a T-Wave collision cell provides maximum signal in MRM mode, even at dwell times as short as five milliseconds.



EASE-OF-USE: INTELLISTART

First-of-its-kind IntelliStart[™] Technology automates system set-up. It enables users, who do not have extensive expertise with operating MS instruments, to acquire data with confidence that the system is operating with optimum performance.

An integrated system of fluidics, electronics, and software continually monitors system performance. Through a series of diagnostic checks, the system can report when it is ready for use. Any failures will result in a red-light warning that action may be required before analysis can proceed. IntelliStart enables system alerts to be flagged and automates routine tasks, including Autotune, Autocalibration, MRM Method Development, and LC/MS system performance check. These are driven by integrated system fluidics.



System performance confidence

IntelliStart Technology enables automated, routine reporting of total LC/MS/MS system performance.

Customizable LC/MS/MS methods allow the system to inject a diagnostic sample on-column. This helps the user identify any issues with the configured system by providing an automated report that indicates:

- Sensitivity (S/N)
- Response (peak area, peak height)
- Chromatographic performance
 - (peak width, retention time)

System Check can be easily customized for scheduled reporting on any specified compound and method.

ne Calibration System Check	
Number Vial Volume Pre-Run 1 10 1 Run 6 1 10 1	Setpoint Tolerance Retention Time 1 0.001 +/- mins Peak Area 0.001 % 0.001 % 0.001
Hithod	Prok Height F 0.001 % RSD Prok Width F 0.001 +/- mins
LC Browsc. MS Browsc. ^ SBr / MRM @ Scaming Mass 100	Signal/Noise I [®] 10 11 Noise Range 0 to 0.001 Noise Method C [®] RMS I [®] Peak to Peak
Scheidide Current Scheidide : DB	Set Schedule
Reporting	

ROBUST PRODUCTIVITY

- IntelliStart Technology automated system set-up, with integrated fluidics device, gives the user the green light
- ZSprayTM Interface industry-leading, dualorthogonal LC/MS interface
- T-Wave collision cell for UPLC compatibility
- High-Speed MS/MS fastest MRM capability for rapid, accurate quantitation
- ESCi Multi-Mode Ionization
 Source ESI and APCI in the same run
- IonSABRE[™] APCI source and APPI probe – high performance probe options for chemical and photo ionization
- Rapid polarity switch double productivity by acquiring both modes in the same run
- Empower[™] or MassLynx[™] Software – flexible software solutions to suit your environment
- System integration fully designed as an integral component of the ACQUITY UPLC System solution
- Connections INSIGHT[®] Intelligent Services – proactive online service support

FLEXIBILITY: YOUR LABORATORY, YOUR CHOICE



ACQUITY TQD system console

- Simple plug-in to Empower or MassLynx Software
- IntelliStart system set-up
- MRM method developer
- Connections INSIGHT
- System diagnostics
- System service history

MassLynx Software

- Flexible and sophisticated instrument control and data acquisition
- Batch quantification, QC checking, and rapid results review with dedicated Application Managers
- Automated system performance check and reporting
- Automated batch method development and analysis with QuanOptimize[™] Application Manager
- Walk-up quantitation with the open access Application Manager for UPLC/MS/MS

Empower 2 Software

- Quick and easy storage and retrieval of UPLC/MS/MS data using an embedded relational database
- Scalable, modular architecture easily converts from a single workstation environment to an enterprise-wide system
- Built-in support for a data-secured regulatory laboratory environment
- Full system suitability reporting
- Method Validation Manager (MVM) for automation of the entire chromatographic method validation process, from planning experiments to generating final reports



WALK-UP MS/MS

IntelliStart Technology makes it easy to acquire UPLC/MS/MS data with confidence. For those wanting to go a step further, complete open access MS and MS/MS quantitation are available. Develop methods for new compounds using the simple MRM method developer, or select a method for a known compound from the method library.

Open access quantitation uses the $\mathsf{OpenLynx}^{\mathsf{TM}}$

Application Manager sample login feature to enable chemists to simply walk up to the system and submit their compounds for analysis. Results are processed in QuanLynx[™] Application Manager and can be emailed directly to the chemist, exported to LIMS, or presented as a printed report.

MassLynx Software

The ability to accurately and rapidly reduce raw data to useful information is as important as the analytical technology employed. MassLynx Software is available with a range of application-specific data processing tools to simplify raw data analysis.

- QuanLynx Application Manager provides accurate quantitative results from LC/MS/MS data and is a standard feature of MassLynx Software
- TargetLynx[™] Application Manager offers advanced quantitation of target compounds, featuring automated QC checks and confirmatory ion measurements
- QuanOptimize Application
 Manager is a software plug-in that enables high-throughput
 LC/MS/MS method development and quantitation

Laboratory informatics

Waters is committed to providing powerful software solutions for scientific data management, network integration, compliance management, and laboratory productivity.

- NuGenesis[®] SDMS information management that stores and manages all scientific information
- Analytical Workflow Manager software – tracks all analytical lab tasks while providing fast and secure data handling



In TargetLynx, automated QC checks flag results that are outside defined tolerances.

connections

Connections INSIGHT is revolutionizing the way laboratory instruments are serviced, by using Intelligent Device Management technology to provide diagnostic information for the ACQUITY TQD. Through a secure internet connection, Connections INSIGHT creates a

ACQUITY TQD. Through a secure internet connection, Connections INSIGHT creates a virtual and proactive support presence in your lab. It monitors your ACQUITY TQD's key performance parameters, enabling predictive system maintenance and helping you achieve greater productivity.

Connections INSIGHT is available at no additional cost for all UPLC systems covered under a Waters Total Assurance Warranty or Support Plan.

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References

 The traveling wave device described here is similar to that described by Kirchner in US Patent 5,206,506 (1993).

THE SCIENCE OF WHAT'S POSSIBLE.

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