

TRIPLE QUADRUPOLE MASS  
SPECTROMETRY

# TQ55

## LC-MS/MS SERIES

Reliable triple quadrupole performance for modern routine laboratories. Designed for pharmaceutical, clinical, food safety, and environmental analysis.

**Confident Quantitation** —  $\leq 4$  fg IDL, S/N  $\geq 800,000:1$

**Efficient Throughput** —  $>500$  MRM/s,  $\leq 25$  ms polarity switching

**Robust Performance** — Gold-plated quadrupole,  $180^\circ$  curved collision cell

**Dual Ion Sources** — ESI & APCI, 30-sec plug-and-play switching

**UHPLC Integration** — 1300 bar, 0.001–2 mL/min flow rate

**Intelligent Software** — DMRM, auto-tuning, method templates



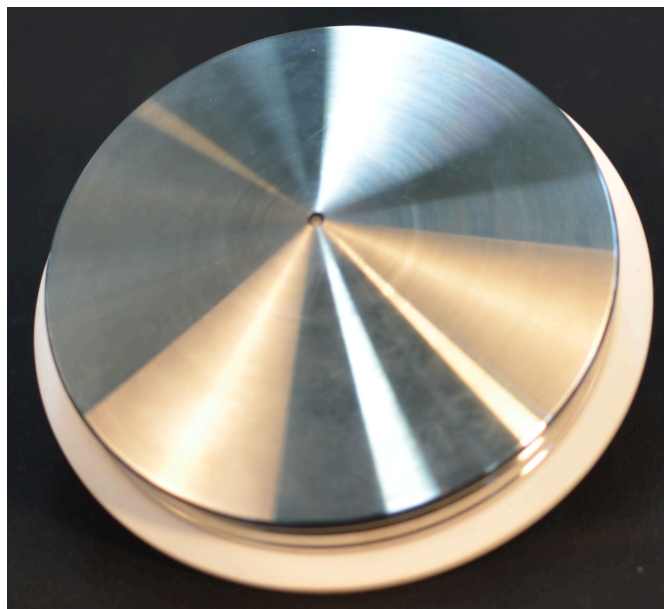
# Engineered for Performance

Precision-engineered ion optics deliver exceptional sensitivity, speed, and reliability

## Larger Cone Aperture, Higher Ion Transmission

The enlarged cone aperture design delivers significantly higher ion transmission efficiency compared to conventional capillary interfaces. By maximizing the ion sampling opening, more analytes reach the mass analyzer for enhanced sensitivity.

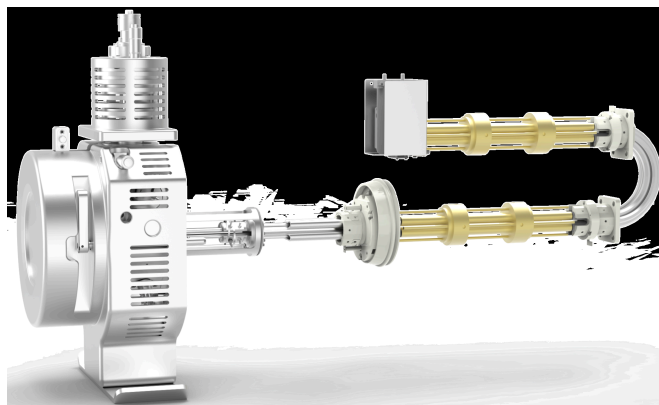
The cone aperture architecture **prevents salt deposition** and is easily cleaned or reused without consumable replacement — no quartz or metal capillary tubes to replace. This reduces operating costs and downtime while maintaining consistent performance.



## Gold-Plated Quadrupole & 180° Curved Collision Cell

**Q1, Q2, and Q3** precision quadrupoles in spatial tandem configuration. Gold-plated rods exceeding 200 mm ensure mass axis stability and unit mass resolution with three adjustable levels per MRM pair.

The **180° curved collision cell** provides faster ion transport and higher ion capacity while effectively reducing cross-contamination. High-strength axial linear acceleration minimizes pause time without compromising data quality.

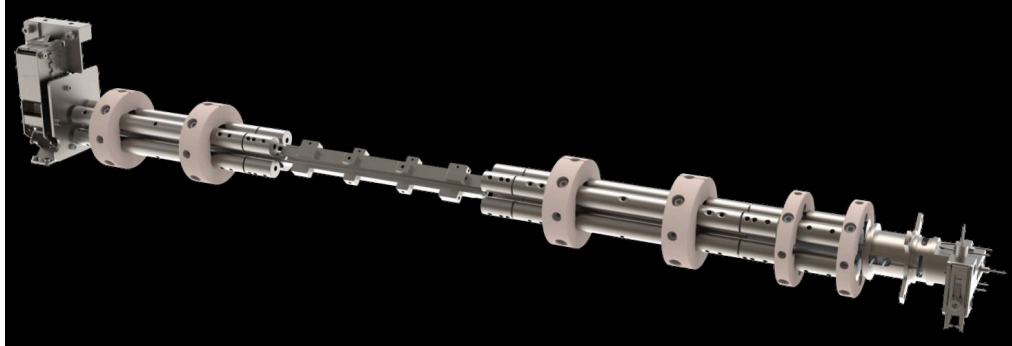


ENLARGED DETAIL

# Quadrupole & Collision Cell

## Tandem Metal Quadrupole Design

**Q1, Q2, and Q3** utilize precision-machined metal rods with pre- and post-quadrupole ion focusing. This design balances ion incidence angles and eliminates fringe field effects.



### Pre-Rod Ion Focusing

Pre- and post-quadrupole elements eliminate fringe field effects, reducing background noise from neutral molecules.

### 180° Curved Collision Cell

Faster ion transport with higher capacity. Effectively avoids cross-contamination and removes neutral particles.

### Axial Linear Acceleration

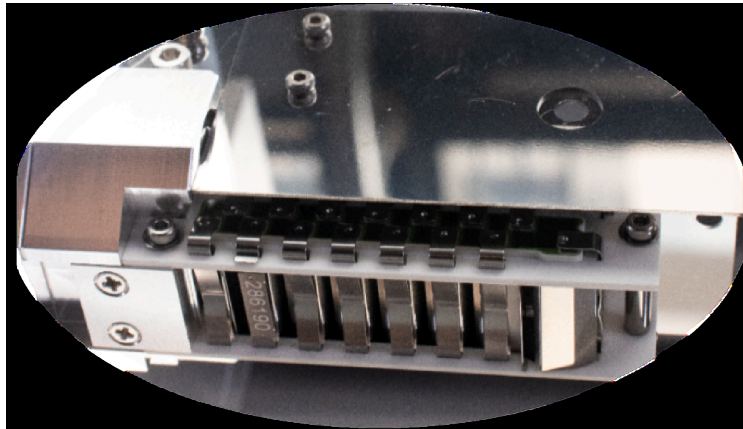
High-strength axial field enables faster ion acceleration with shorter pause time and dwell time during MRM.

ENLARGED DETAIL

PATENTED TECHNOLOGY

# Discrete Dynode Electron Multiplier

Extended Lifetime Without Sensitivity Compromise



The discrete dynode electron multiplier is the result of collaborative R&D with our technology partners. Unlike conventional continuous dynode multipliers, this patented design uses discrete, individually optimized dynode stages to deliver consistent high-gain performance over an extended operational lifetime.

Each dynode stage is precisely engineered to maintain optimal electron multiplication efficiency while resisting contamination from sample matrices. You get the sensitivity you need for trace analysis, day after day, without performance degradation.

The design delivers dynamic scanning range comparable to counting mode, with high gain, low noise, and excellent water resistance for robust routine operation.

## Longer Operational Lifetime

Discrete dynode stages resist contamination and wear

## No Sensitivity Loss

High gain maintained across extended use

## Low Noise

Improved S/N ratio for trace analysis

## Robust & Water Resistant

Anti-contamination for routine operation

# Versatile. Reliable. Proven.

Validated across pharmaceutical, clinical, food safety, and environmental applications

## PHARMACEUTICAL & BIOANALYSIS

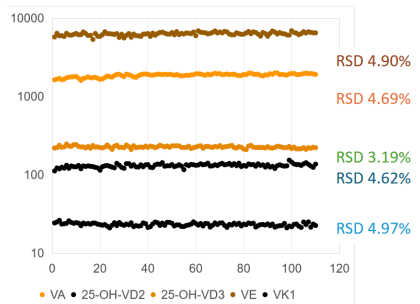
Quantitative determination of drugs and metabolites in plasma, serum, and biological matrices. Supports preclinical and clinical studies.

## CLINICAL & TRANSLATIONAL RESEARCH

Measurement of therapeutic drugs, metabolites, and biomarkers in complex biological samples. Reliable retention times and signal stability.

## FOOD SAFETY & ENVIRONMENTAL

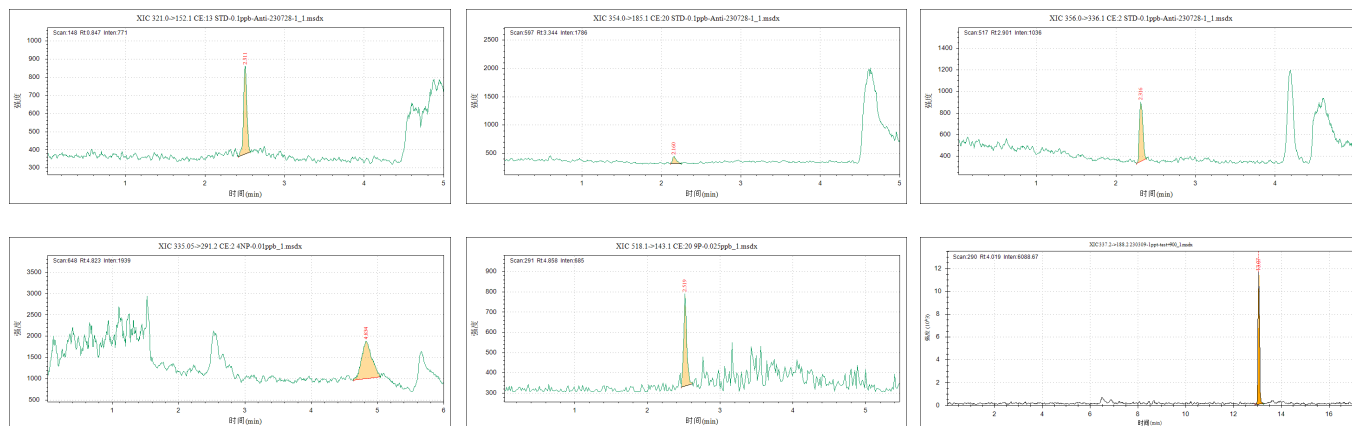
Targeted analysis of pesticides, veterinary drugs, mycotoxins in food and feed. Monitoring pollutants and emerging contaminants in waters.



## Proven Stability Across 100+ Real Customer Samples

Real sample data from over 100 customers demonstrates exceptional stability. Tests conducted on real mailed samples using customer-provided methods without optimization. Vitamin analytes show RSD values of 3.19% to 4.97%, confirming robust performance for routine quantitative analysis with challenging biological matrices.

## Drug Residue Detection at Sub-ppb Levels



# TQ55 LC-MS/MS

## MASS SPECTROMETER

<b>Ion Source</b>	Plug-and-play ESI & APCI, 30-sec switching, no venting
<b>ESI Flow Rate</b>	5 $\mu$ L/min – 3 mL/min; Source temp $\geq$ 700°C
<b>APCI Flow Rate</b>	200–2000 $\mu$ L/min; Temp $\geq$ 650°C
<b>Mass Range</b>	5–2000 amu (9120A); 5–1250 amu (9120B)
<b>Scan Speed</b>	>30,000 amu/sec
<b>Resolution</b>	Unit mass; 3 adjustable levels per MRM pair
<b>Mass Stability</b>	<0.1 amu/24 hours
<b>Mass Accuracy</b>	0.01% or 0.2 Da across full mass range
<b>Polarity Switching</b>	$\leq$ 25 ms
<b>Cross-contamination</b>	<0.01%
<b>Dynamic Range</b>	6 orders of magnitude
<b>MRM Dwell Time</b>	$\leq$ 1 ms; Channel speed >500 MRM/s
<b>Sensitivity (9120A)</b>	ESI+ IDL $\leq$ 4 fg reserpine; S/N $\geq$ 800,000:1 (1 pg)
<b>Sensitivity (9120B)</b>	ESI+ IDL $\leq$ 2 fg reserpine; S/N $\geq$ 850,000:1 (1 pg)
<b>Reproducibility</b>	5 pg tacrolimus: Area RSD <1.5%, RT RSD <0.25%
<b>Scan Functions</b>	Full Scan, SIM, Product Ion, Precursor Ion, Neutral Loss, MRM, Mixed
<b>Vacuum System</b>	400+300 L/S turbo pump; 40 m <sup>3</sup> /h mechanical pump
<b>Detector</b>	Discrete dynode electron multiplier (patented)

## UHPLC SYSTEM

<b>Pump</b>	Binary UHPLC gradient, 4 solvent selections (A1/A2, B1/B2)
<b>Flow Rate</b>	0.001–2.000 mL/min; Accuracy $\pm$ 1%
<b>Pressure</b>	0–1300 bar (0–18,850 PSI)
<b>Gradient</b>	0–100%; Accuracy $\pm$ 0.5%; Precision $\leq$ 0.15% RSD
<b>Autosampler</b>	162-position (2 mL vials) or 3 $\times$ 96-well plates; 0.1–50 $\mu$ L
<b>Injection</b>	Full/partial/needle-overfill; Repeatability <0.3% RSD
<b>Carryover</b>	<0.05% (standard wash); <0.01% (additional wash)
<b>Column Oven</b>	Ambient +5°C to 60°C; Accuracy $\pm$ 0.5°C

## SOFTWARE & DATA SYSTEM

<b>Acquisition</b>	Real-time LC & MS control, auto-tune/calibration
<b>Method Dev</b>	MRM parameter optimization, DMRM, database import
<b>Processing</b>	Automated peak detection, calibration, batch quantitation
<b>Export</b>	MZML universal format; customizable quantitative reports