



ATOMIC ABSORPTION SPECTROMETER
QualiAAS™ and QT-AAS Series

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GENERAL OVERVIEW

Precision in Every Spectrum: Advanced Elemental Analysis Solutions

Atomic Absorption Spectroscopy (AAS) is the standard method for quantitative elemental analysis. It measures the absorption of optical radiation by free atoms to determine the concentration of over 70 metallic and non-metallic elements. This technique provides the high precision required for material characterization and quality control.

Industry Requirements & Challenges

Modern laboratories face strict requirements for lower detection limits (LDL) and high sample throughput. Operators are tasked with analyzing complex matrices efficiently while minimizing cost per analysis and reducing manual errors. The primary challenge is securing consistent, repeatable results that meet rigorous industry benchmarks without compromising speed.

Critical requirements for modern AAS systems include:

- **Trace-Level Detection:** Essential for accurate results in low-concentration samples.
- **Process Automation:** Required to increase throughput and data reliability.
- **Operational Flexibility:** The ability to switch between flame and furnace modes efficiently.

The Qualitest Solution

Qualitest offers two distinct series to meet these analytical demands, both engineered for full compliance with ASTM and ISO standards to ensure your laboratory meets international testing protocols automatically:

- **QualiAAS™ Series:** A high-performance suite offering superior selectivity and automation, built to handle the most demanding multi-element applications with maximum precision.
- **QT-AAS Series:** A compact, PC-controlled system featuring intelligent gas control and flexible configurations, designed for laboratories prioritizing space efficiency and operational safety.

By integrating stable optical systems and robust data processing, these instruments deliver the accuracy needed for petrochemistry, metallurgy, mining, and food safety applications.

APPLICATIONS

Metallurgy & Materials Science

Quality control of ferrous and non-ferrous metals, steel alloys, and precious metals to ensure structural integrity and composition accuracy.

Petrochemistry & Energy

Analysis of wear metals in lubricating oils, detection of additives in fuels, and monitoring of trace impurities in refinery products (conforming to ASTM D standards).

Environmental Monitoring

Detection of heavy metals (such as Lead, Cadmium, and Mercury) in wastewater, drinking water, soil, and atmospheric dust to meet EPA and ISO environmental protection regulations.

Geology & Mining

Rapid grade control and geochemical prospecting, including the analysis of ores, concentrates, and tailings for mineral exploration.

Food & Beverage Safety

Quantification of essential minerals and detection of toxic trace elements to ensure consumer safety and compliance with international food standards.

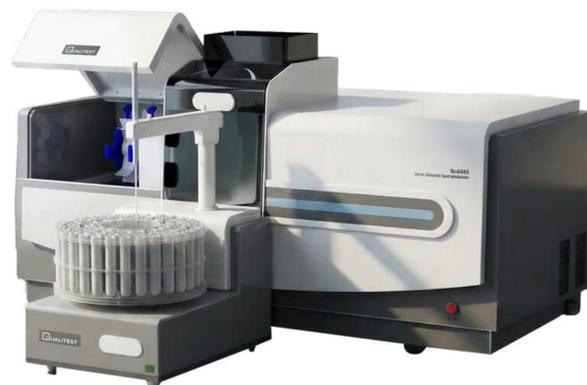
Pharmaceuticals & Life Sciences

Testing for elemental impurities in raw materials and finished drug products, ensuring strict adherence to pharmacopeial safety limits.

QualiAAS™ Series

The High-Performance Suite

The QualiAAS™ Series is the flagship solution for laboratories requiring maximum versatility and high-throughput capability. Engineered to handle the most demanding analytical matrices, this series integrates robust flame and graphite furnace atomization technologies into a single, comprehensive workstation. It is the preferred choice for research facilities and high-volume industrial labs where adaptability and superior detection limits are non-negotiable. Available models are:



QualiAAS™ 3000F



QualiAAS™ 3000FG



QualiAAS™ 3000FG PRO

FEATURES/ADVANTAGES COMPARISON

Shared Core Features

- **Stable Baseline & Low Noise Performance:** Baseline drift \leq 0.002 Abs and noise \leq 0.001 Abs under steady and dynamic conditions, ensuring reliable signal stability.
- **Precision Optical System:** Czerny–Turner monochromator with 1800 lines/mm holographic grating and automated slit selection for accurate wavelength control.
- **Reliable Background Correction:** Deuterium lamp background correction with high correction ratio, supporting accurate measurements in complex matrices.
- **Automated Light Source Management:** Multi-lamp turret with automatic rotation, switching, collimation, and editable memory settings for each element.
- **User-Friendly Software Platform:** Integrated software supporting automatic optimization, calibration, data processing, and report generation.
- **Comprehensive Safety Protection:** Hardware and software safety interlocks covering flame operation, gas flow, ignition, and abnormal operating conditions.

Differentiating Features & Advantages

QualiAAS™ 3000F

- **Flame AAS Configuration:** Designed for routine elemental analysis using air–acetylene flame atomization.
- **Simplified System Architecture:** Focused flame-only design reduces operational complexity and maintenance requirements.
- **Cost-Effective Laboratory Solution:** Optimized for QC and routine testing environments with high reliability.

QualiAAS™ 3000FG

- **Flame + Graphite Furnace Capability:** Supports both flame and graphite furnace atomization within one platform.
- **Expanded Sensitivity Range:** Enables trace-level elemental determination using graphite furnace techniques.
- **Flexible Method Selection:** Seamless switching between flame and GF methods to accommodate diverse analytical needs.

QualiAAS™ 3000FG Pro

- **Advanced Graphite Furnace System:** High-speed longitudinal heating with precise temperature control up to 3000 °C.
- **Enhanced Automation & Control:** Fully automated furnace positioning, optimization, and gas control for improved repeatability.
- **Designed for High-Demand Applications:** Suitable for laboratories requiring high sensitivity, high throughput, and long-term analytical stability.

TECHNICAL SPECIFICATIONS & CONFIGURATIONS COMPARISON

SPECIFICATIONS	DETAILS		
Model	QualiAAS™ 3000F	QualiAAS™ 3000FG	QualiAAS™ 3000FG PRO
Optical & Spectral Performance			
Wavelength Range	170 – 900 nm		
Wavelength Accuracy	≤ ±0.10 nm		
Wavelength Repeatability	≤ 0.05 nm		
Monochromator	Czerny–Turner		
Focal Length	277 mm		
Diffraction Grating	1800 lines/mm, blaze 250 nm		
Spectral Bandwidths	0.1 / 0.2 / 0.4 / 0.8 / 1.6 nm (all automatically adjustable)		
Detector	Equipped with an imported high-sensitivity, wide spectral bandwidth photomultiplier tube		
Baseline & Resolution Performance			
Baseline Drift (Static)	≤ 0.002 Abs		
Baseline Noise (Static)	≤ 0.001 Abs / 30 min		
Baseline Drift (Dynamic)	≤ 0.002 Abs		
Baseline Noise (Dynamic)	≤ 0.001 Abs / 15 min		
Spectral Bandwidth Deviation	≤ 0.02 nm		
Mn Doublet Resolution	Valley/Peak ≤ 25%		
Background Correction			
Deuterium Lamp Correction	1.0 Abs, ≥ 90×		
Self-Absorption Correction	2.0 Abs, ≥ 90×		

TECHNICAL SPECIFICATIONS & CONFIGURATIONS COMPARISON

SPECIFICATIONS	DETAILS		
Model	QualiAAS™ 3000F	QualiAAS™ 3000FG	QualiAAS™ 3000FG PRO
Analytical Performance			
Copper (Flame) LOD	≤ 0.002 µg/mL		
Copper Characteristic Concentration	≤ 0.025 µg/mL / 1%		
Copper Precision	RSD ≤ 0.3%		
Cadmium (Graphite Furnace) LOD	–	≤ 0.4 pg	≤ 0.4 pg
Cadmium Characteristic Content	–	≤ 0.5 pg	≤ 0.5 pg
Cadmium Precision	–	RSD ≤ 2.0%	RSD ≤ 2.0%
Light Source System			
Lamp Positions	8	8	8
Simultaneous Illumination	1–8 lamps	1–6 lamps	1–8 lamps
Atomization System Configuration			
Flame Atomization	Yes	Yes	Yes
Graphite Furnace Atomization	–	Yes	Yes
Max GF Temperature	–	3000 °C	3000 °C
GF Heating Rate	–	> 3000 °C/s	> 3000 °C/s
GF Temperature Accuracy	–	≤ 1%	≤ 1%
Safety Protection			
Safety System	Flame safety	Flame + GF safety	Flame + GF safety
Alarm Architecture	Hardware + software		

TECHNICAL SPECIFICATIONS & CONFIGURATIONS COMPARISON

SPECIFICATIONS	DETAILS		
Model	QualiAAS™ 3000F	QualiAAS™ 3000FG	QualiAAS™ 3000FG PRO
Dimensions & Weight			
Main Unit Dimensions (LxWxH)	1020 × 530 × 500 mm 85 kg (187 lbs)	1020 × 530 × 500 mm 85 kg (187 lbs)	1020 × 530 × 500 mm 85 kg (187 lbs)
Graphite Furnace Power Supply (LxWxH)	–	350 × 530 × 430 mm 32 kg (70,5 lbs)	350 × 530 × 430 mm 32 kg (70,5 lbs)
GF Automatic Sampler (LxWxH)	–	350 × 250 × 300 mm 15kg (33 lbs) (Optional)	350 × 250 × 300 mm 15kg (33 lbs)
Flame Automatic Sampler	440 × 290 × 440 mm 14 kg (31 lbs)	440 × 290 × 440 mm 14 kg (31 lbs) (Optional)	440 × 290 × 440 mm 14 kg (31 lbs)
Optional & Expandable Configurations			
Flame Automatic Sampler	✓	✓	✓
Graphite Furnace Automatic Sampler	–	✓	✓
Autosampler Capacity (Flame)	70 positions	70 positions	70 positions
Autosampler Capacity (Graphite Furnace)	–	150+5 optional slots (standard 60+6 slots)	150+5 optional slots (standard 60+6 slots)
Dual Pump Sampling System	–	100 µL injection pump and 1 mL cleaning pump	
Injection Repeatability	–	≤ 0.5%	≤ 0.5%
Oxygen-Rich High-Temperature Flame	✓	✓	✓
Wide Slit Combustion Head	✓	✓	✓
Adjustable Nebulizer	✓	✓	✓
Hydride Vapor Generator	✓	✓	✓
Audit Trail Software	✓	✓	✓

COMPARISON SUMMARY



QualiAAS™ 3000F

- Routine flame AAS analysis
- Ideal for QC and routine laboratories
- Cost-effective elemental testing



QualiAAS™ 3000FG

- Combined flame and graphite furnace AAS
- Enhanced sensitivity for trace analysis
- Flexible solution for multi-application labs



QualiAAS™ 3000FG Pro

- Advanced flame + graphite furnace platform
- Optimized for trace and ultra-trace analysis
- Designed for research and regulated laboratories

QT-AAS™ Series

The Intelligent Compact Series

The **QT-AAS Series** is a modern, fully PC-controlled Atomic Absorption Spectrophotometer designed to deliver precision without the footprint of traditional floor-standing units. Combining a sleek, compact chassis with an advanced optical system, **this series analyzes over 70 metallic and non-metallic elements with exceptional stability.** It is the ideal solution for laboratories requiring a flexible, space-saving instrument that does not compromise on safety or analytical performance.



QT-AAS29
Series



QT-AAS30
Series



QT-AAS60
Series



FEATURES/ADVANTAGES

Total Reflection Optical System

Reduces optical energy loss across the entire wavelength range, delivering a high signal-to-noise ratio, improved baseline stability, and lower detection limits.

Automatic Pneumatic Control Module

Integrates intelligent gas and pressure management to enhance analytical accuracy while improving operational safety for both the instrument and the operator.

Automatic Vertical Lamp Turret

Supports 4/8-lamp configurations with 360-degree rotation, maintaining precise optical alignment and stable performance regardless of lamp position or gravity effects.

Comprehensive Background Correction

Standard deuterium lamp background correction is provided for all models, with high-performance self-absorption correction available on double-beam configurations to ensure accurate results for complex samples.

Automatic Burner Adjustment

Automatically optimizes burner height and position to achieve maximum sensitivity, consistent atomization, and improved flame operation safety.

Modular Optical and Electronic Design

Modular construction of the optical system and circuitry simplifies installation, maintenance, troubleshooting, and future system upgrades.

Transversely Heated Graphite Tube

Ensures uniform temperature distribution throughout the graphite tube, improving atomization efficiency, analytical repeatability, and extending graphite tube service life.

Integrated Safety Protection System

Provides continuous monitoring of flame status, gas pressure, and furnace operation, with automatic shutdown and alarm activation under abnormal operating conditions.

TECHNICAL SPECIFICATIONS COMPARISON

SPECIFICATIONS	DETAILS						
Series	QT-AAS29 Series			QT-AAS30 Series		QT-AAS60 Series	
Model	QT-AAS2914	QT-AAS2918	QT-AAS2928	QT-AA3014	QT-AA3018	QT-AA6018	QT-AA6028
Optical System							
Optical Type	Single beam	Single beam	Double beam	Single beam		Single beam	Double beam
Monochromator	Czerny–Turner, 350 mm						
Wavelength Range	190–900 nm						
Grating	Holographic, 1800 lines/mm						
Slit Width	Automated slit selection 0.1, 0.2, 0.4, 0.7, 1.4, 2.0 nm						
Wavelength Accuracy	±0.3 nm	±0.2 nm	±0.15 nm	±0.3 nm	±0.2 nm	±0.2 nm	±0.15 nm
Wavelength Repeatability	±0.1 nm	±0.1 nm	±0.05 nm	±0.1 nm		±0.1 nm	±0.05 nm
Lamp Turret	Auto 4-lamp	Auto 8-lamp	Auto 8-lamp	Auto 4-lamp	Auto 8-lamp	Auto 8-lamp	Auto 8-lamp
Detector	Wide range UV sensitive photomultiplier tube						
Photometric Performance							
Reading Mode	Transmittance(T), Absorbance(A), Concentration(C)						
Photometric Range	0~125%T, -0.1~3.0A						
Static Baseline Drift (Cu)	≤0.004 A / 30 min	≤0.003 A / 30 min	≤0.002 A / 30 min	≤0.004 A / 30 min	≤0.003 A / 30 min	≤0.003 A / 30 min	≤0.002 A / 30 min
Dynamic Baseline Drift (Cu)	≤0.006 A / 15 min	≤0.005 A / 15 min	≤0.004 A / 15 min	≤0.006 A / 15 min	≤0.005 A / 15 min	≤0.005 A / 15 min	≤0.004 A / 15 min
Background Correction	D ₂	D ₂	D ₂ + Self-absorption	D ₂		D ₂	D ₂ + Self-absorption

TECHNICAL SPECIFICATIONS COMPARISON

SPECIFICATIONS	DETAILS						
Series	QT-AAS29 Series			QT-AAS30 Series		QT-AAS60 Series	
Model	QT-AAS2914	QT-AAS2918	QT-AAS2928	QT-AA3014	QT-AA3018	QT-AA6018	QT-AA6028
Graphite Furnace Analysis							
Characteristic Concentration	-	-	-	Cd≤0.9pg , Cu≤20pg		Cd≤0.6pg , Cu≤20pg	Cd≤0.5pg , Cu≤20pg
Detection Limit	-	-	-	Cd≤1.5pg , Cu≤25pg		Cd≤1.0pg , Cu≤25pg	Cd≤0.8pg , Cu≤25pg
Repeatability (Cu)	-	-	-	RSD≤4%		RSD≤3%	RSD≤2.5%
Temperature Range	-	-	-	Ambient -3000°C			
Ramp and holding time	-	-	-	1-255s			
Heating Rate	-	-	-	Maximum linear heating rate 2000°C/s			
Atomization Heating Method	-	-	-	Light-controlled heating, Time-controlled heating, General heating			
Gas Flow Rate Inside Tube	-	-	-	1 L/min			
Gas Flow Rate Outside Tube	-	-	-	4-speed adjustable (0, 50, 200, 250ml/min)			
Safety Protection	-	-	-	Water flow sensor, argon pressure sensor, Furnace body temperature sensor, graphite tube installation self-inspection.			
Flame Analysis							
Characteristic Concentration	Cu≤0.04ug/ml	Cu≤0.035ug/ml	Cu≤0.02ug/ml	-	-	Cu≤0.035ug/ml	Cu≤0.02ug/ml
Detection Limit	Cu≤0.008ug/ml	Cu≤0.006ug/ml	Cu≤0.004ug/ml	-	-	Cu≤0.006ug/ml	Cu≤0.004ug/ml
Repeatability (Cu)	RSD≤1%	RSD≤0.6%	RSD≤0.5%	-	-	RSD≤0.6%	RSD≤0.5%
Acetylene Flow Control	Auto 12-level	Auto 12-level	Auto 12-level	-	-	Auto 12-level	Auto 12-level
Air Flow Control	Auto 4-level	Auto 4-level	Auto 4-level	-	-	Auto 4-level	Auto 4-level
Nebulizer	High efficiency glass			-	-	High efficiency glass	
Burner Adjustment	Automatic up and down			-	-	Automatic up and down	
Burner Head	Titanium alloy 100mm burner for air/acetylene operation			-	-	Titanium alloy 100mm burner for air/acetylene operation	
Premix Chamber	Corrosion resistant			-	-	Corrosion resistant	
Safety Protection	Flame sensor, gas leak sensor, gas pressure sensor			-	-	Flame sensor, gas leak sensor, gas pressure sensor	

TECHNICAL SPECIFICATIONS COMPARISON

SPECIFICATIONS	DETAILS						
	QT-AAS29 Series			QT-AAS30 Series		QT-AAS60 Series	
Series	QT-AAS2914	QT-AAS2918	QT-AAS2928	QT-AA3014	QT-AA3018	QT-AA6018	QT-AA6028
Model	QT-AAS2914	QT-AAS2918	QT-AAS2928	QT-AA3014	QT-AA3018	QT-AA6018	QT-AA6028
Data Processing & General							
Software	RGWIN AAS software pacakage						
Analytical Method	Flame AA, Flame AE, Hydride Generation						
Concentration Calculation Method	Standard curve(6 linear/non-linear fitting), Standard Addition, Interpolation						
Repeated Measurement Times	1-30 times, calculate the average, show SD and RSD value of absorbance and concentration						
QA/QC Function	Correlation coefficient, SD & RSD of Abs and calculate SD & RSD of concentration						
Report Printing	Parameter printing, resulting printing						
Communication Port	Standard RS-232						
Computer	External(excluded)						
Dimension & Weight	850*650*550MM(W*D*H), 100Kg						
Power Supply	110/220V, 50/60Hz						
Working Environment	Temperature 10 ~ 35 °C, Humidity ≤85%						

PACKING LIST COMPARISON

SPECIFICATIONS	DETAILS		
	QT-AAS29 Series	QT-AAS30 Series	QT-AAS60 Series
Series	QT-AAS29 Series	QT-AAS30 Series	QT-AAS60 Series
Main Unit	1	1	1
Power Cable	1	1	1
Data Cable	1	1	1
Screwdriver	1	1	1
Cu Hollow Cathode Lamp (Cu HCL)	1	-	1
Cd Hollow Cathode Lamp (Cd HCL)	-	1	1
USB (Manual & Software)	1	1	1
Air Compressor	1	-	1
Acetylene Tube, 6 mm (Orange)	10m	-	10m
Air Tube, 6 mm (Transparent)	10m	-	10m
Drain Tube	2m	-	2m
Acetylene Pressure Reducing Valve Connector	1	-	1
Argon Pressure Reducing Valve Connector	-	1	1
High-Power Socket	-	1	1
Graphite Tube	-	5	5
Graphite Furnace Camera Connection Cable	-	1	1
6×4 mm Argon Tube (Transparent)	-	10m	10m
5-50μL Pipette	-	1	1
200-μL Pipette (1000 pcs/bag)	-	1	1
6×10 mm Cooling Water Tube	-	6m	6m
5 A Fuse	3	3	3
Ignition Filament	5	-	5

COMPARISON SUMMARY



QT-AAS29 Series

- Flame-only configuration for routine elemental analysis.
- Essential accessories included for immediate operation.
- Cost-efficient solution for standard laboratory testing.



QT-AAS30 Series

- Flame + Graphite Furnace capability for enhanced sensitivity.
- Includes argon gas accessories and graphite furnace components.
- Balanced performance for laboratories requiring multi-method analysis.



QT-AAS60 Series

- Fully integrated Flame and Graphite Furnace system.
- Complete gas, cooling, and safety accessory package included.
- Designed for advanced research and high-precision applications.



QUALITEST™

ADVANCED TESTING TECHNOLOGIES

KEY QUALIBENEFITS



Best Price Guarantee : Qualitest is committed to delivering top-quality, competitive Atomic Absorption Spectrometers at unbeatable prices. Our confidence in providing the highest value for your investment is backed by a price match guarantee.



Trusted Partner for Fortune 500 Companies : Join the ranks of Fortune 500 companies who choose Qualitest as their trusted vendor. Benefit from tailored solutions and proven excellence, gaining a strategic edge for business success.



Efficient Global Logistics : Enjoy quick delivery of standard products through our extensive network of worldwide distribution centers. Our high shipping volume enables us to offer the most competitive rates for global delivery.



Centralized Service & Support Coordination : Our central service department manages efficient customer service support directly or through our global QualiService authorized network, ensuring seamless assistance.



Exceeding Standards : Qualitest products are meticulously crafted to not only meet but surpass North American and global standards, ensuring uncompromised quality. Our dedication to excellence drives every aspect of our production process.



Qualitest Finance Packages : Explore affordable payment plans and flexible options through our QualiFinance program, making quality products and solutions accessible without compromising your budget.



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Connect with us

Contact our **QualiTeam** today to find out how we can help your organization **select the most suitable testing solution** for your application, requirements, and budget.

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