Technical Data

analytikjena
An Endress+Hauser Company

contrAA 800 Series
Atomic Absorption Spectrometer



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General

- Atomic absorption spectrometer for advanced applicability in routine and research with a Xenon short arc lamp (continuum source AAS, CS-AAS), a fast-sequential high-resolution (HR) spectrometer, and simultaneous background correction (HR-CS-AAS)
- Three benchtop models on one instrumental platform for flame, graphite furnace, and hydride/HydrEA application
- Wide range of performance-enhancing accessories maximizing productivity, safety, and ease of use

Models

Application range	contrAA 800 F	contrAA 800 G	contrAA 800 D
Flame	☑		☑
Graphite furnace		☑	☑
hydride and cold vapour technique	■	■*	■
Solid AA		■	■
Emission mode	☑		☑

☑ included, ■ optional, *HydrEA analysis

Optics

Spectrometer type	▪ Fast-sequential echelle set-up (focal length 380 mm) in single-beam configuration, ▪ Quartz-coated reflecting optics in a dust-free and light-proof encapsulation and purgeable with inert gas for maximum protection against dust, and corrosive vapors
Double monochromator	High resolution double monochromator with quartz prism and rotatable grating
Spectral resolution	0.002 nm at 200 nm (FWHM value ≤3.8 pm for As 193.7 nm)
Wavelength range	185-900 nm (continuous wavelength coverage up to 72 elements enabling access to all alternative absorption lines and molecular absorption lines, e.g. PO, CS, GaF)
Wavelength reproducibility	0.4 pm
Background correction	Iterative baseline correction (IBC), alternatively dynamic or static baseline correction, correction of structured background by reference measurement, and/or least square background correction (LSBC)
Detector	CCD Array detector (200 pixels) with high quantum efficiency, increased UV sensitivity, and low signal-to-noise ratios
Light source	▪ Water-cooled Xenon short arc lamp, continuum light source for fast interchange of elements/absorption lines (method parameter) without lamp exchange ▪ Alignment-free lamp replacement by the user
Instrumental sensitivity	Flame: (Cu 324 nm) 0.015 mg/L 1%Abs using a 100 mm burner head (air/acetylene) Graphite furnace: (Pb 283 nm) 0.66 µg/L 1 %Abs (for 20 µL, peak area evaluation)

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Atomizer – Dual Atomizer Concept

Dual atomizer concept

Design	All atomizers mounted in one sample compartment
Interchange	Automatic atomizer interchange (contrAA 800 D)

Flame

Burner	Coded Titanium burner head, 100 mm (air/acetylene), 50 mm (air/acetylene and nitrous oxide/acetylene) with automatic burner head recognition, stepless burner rotation (0-90°), and automatic height adjustment (4-16mm)
Nebulizer	Adjustable nebulizer with internal ceramic capillary and acid-resistant ceramic impact bead
Spray chamber	PPS spray chamber for aqueous and organic solutions
Safety and handling	▪ Multiple sensors monitoring burner head, siphon system, and gas management system (GMS) ▪ Automatic ignition and extinguishment of flame, incl. in case of power outage or gas pressure drop and emergency flushing with compressed air ▪ Nebulizer-Burner system with quick-lock for easy replacement

Graphite furnace

Function	▪ Transversely heated graphite furnace atomizer (THGA) ▪ Stabilized Temperature Platform Furnace (STPF) for lowest interference and highest reproducibility ▪ Integrated autosampler operation and furnace USB camera ▪ Suitable for direct analysis of solid samples (solid AA)
Furnace control	▪ Temperature range from ambient temperature to 3,000 °C, programmable in intervals of 1 °C ▪ Heating rate up to 3,000 °C/s ▪ Self-check system
Graphite tube	Pyrolytically coated graphite (wall or PIN-platform) tubes, self-aligning, sample volume up to 50 µL for standard tubes, up to 40 µL for PIN-platform tubes
Cooling	Included water chiller with 2.5 L/min flow rate, free of sediments, 30 - 40 °C temperature range

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Gas Management System (GMS)

Gas type	Purity	Pressure	Settings	Atomizer technique	Usage
Acetylene	2.6	80 - 160 kPa	Steps in 5 L/h	Flame	Fuel gas
Nitrous oxide	2.5	400 - 600 kPa	Fixed 3 Steps	Flame Flame	Oxidant Additional oxidant
Compressed air	Free of oil, grease, particles	400 - 600 kPa	Fixed 3 Steps 1 Step	Flame Flame Graphite Furnace	Oxidant Additional oxidant Alternative gas Spectrometer Purge
Argon	4.8	600 - 700 kPa	2 Steps 3 Steps	Graphite Furnace Hydride system	Inert gas Carrier gas Spectrometer purge

Data system

Software	ASpect CS (version 2.3 and higher) with optional 21 CFR Part 11 compliance, pre-configured analytical methods and reports, monitoring of quality parameters, e.g. QC control charts.
Requirements (PC)	▪ Operating system: Windows 11 (32-Bit or 64-Bit) ▪ RAM: min. 8 GB ▪ Memory: min. 256 GB, SSD recommended ▪ Graphic resolution: min. 1280 x 1024 px. ▪ 2x USB 2.0

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Accessories

Auto Sampler Range (for liquid samples, with round sample tray)

Models, Specifications	AS-F	AS-FD	AS-GF
contrAA 800F – flame	■	■	
contrAA 800G – graphite furnace			☑
contrAA 800D – duo atomizer	■	■	☑
HS 60 – flow injection hydride system	■	■	
Dimensions (W x D x H) in mm	340 x 460 x 350	340 x 460 x 350	250 x 380 x 550
dilution unit	-	350 x 165 x 310	-
Weight	6.5 kg	10 kg	7.2 kg
Cannula			
▪ Fluid contact material	Pt/Rh	Pt/Rh/PTFE	PFA-M
▪ Number of channels	1	2	1
▪ Internal diameters	0.6 mm	0.6/1.2 mm	0.65 mm
▪ Minimal pipetting volume (one step)		50 µL	1 µL
Tray options with number of positions (sample volume)	139 positions 129 (15 mL) + 10 (50 mL)	139 positions 129 (15 mL) + 10 (50 mL)	108 positions 100 (1.5 mL) + 8 (5 mL)
	54 positions (50 mL)	54 positions (50 mL)	
Automatic cleaning and rinsing cycles	☑	☑	☑
Pre-configured cleaning control (blank level management)	☑	☑	☑
Maximum Dilution Factor (single step)		500	800
Autocalibration from single/stock standards (automatic standard preparation)		☑	☑
Over-range dilution		☑	☑
Automated standard addition calibration		☑	☑
Spiking			☑
Sample pre-concentration			☑
Automatic dosing of modifiers, buffers, etc.			☑

☑ included, ■ optional

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Hydride systems

Models, Specifications and Analytical Parameters	HS 55	HS 60
Accessible elements	Arsenic (As), Selenium (Se), Mercury (Hg), Antimony (Sb), Bismuth (Bi), Tellurium (Te) and Tin (Sn)	
contrAA 800F – flame	■	■
contrAA 800G – graphite furnace	■	■
contrAA 800D – duo atomizer	■	■
Heating regime of hydride cuvette	Electro thermal	Electro thermal
Reaction mode	Batch	Flow
Enrichment by gold trap	■	■
HydrEA analysis	■*	■*
Autosampler		■
Size (W x D x H) in mm	360 x 280 x 370	360 x 240 x 370
Weight Net	14 kg	14 kg

☑ included, ■ optional, *HydrEA upgrade kit is required

solid AA – Accessory for Direct Analysis of Solids, Oils and Waxes

	solid SSA 6	solid SSA 600
Function	▪ Hand-operated tool ▪ Sample platform submitted to graphite furnace manually (Manual weighing and sample preparation needed)	▪ Software-controlled autosampler with integrated liquid dosing unit (for chemical sample preparation and calibration from liquid standards) ▪ Fully automated sample handling from sample weighing to analysis integrated liquid dosing unit enables chemical sample preparation and calibration from liquid standards
Platform material	Pyrolytically coated graphite, trough dimension (W x D x H) 8 mm x 3.5 mm x 1.3 mm	
Sampler tray positions		42, upgradeable to 84 with second sample tray
Micro balance		Integrated, up to 10 g ± 0.001 mg
Typical sample weight	0.05 mg - 3 mg	0.05 mg - 3 mg
Dosing volume		2 - 50 µL
Size (W x D x H) in mm		270 x 600 x 380 for basic unit 90 x 270 x 270 for liquid dosing module
Net weight		16 kg for basic unit 3.5 kg for liquid dosing module

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Other accessories

Accessory	Application	Function
Scraper	Flame	Automatic cleaner of burner head for safe nitrous oxide operation
Segmented flow star SFS 6.0	Flame	Switching valve technology for stable flame conditions, injection mode, and reduced carry over

Physical Data basic unit

	contrAA 800F	contrAA 800G	contrAA 800D
Size (W x D x H) in mm	780 x 775 x 625	780 x 775 x 625	780 x 775 x 625
Weight net	140 kg	170 kg	170 kg
Supply voltage	230 V/110 V	230 V	230 V
Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Fuse protection	16 A	35 A	35 A
Power consumption (basic unit) Max. electrical load (incl. all accessories, < 1 s)	460 VA 650 VA	2,100 VA 20,450 VA	2,100 VA 20,450 VA
Ambient temperatures/ humidity	+5 °C to +40 °C / 90% (at +40 °C) non-condensing		
Exhaust rates	Minimum exhaust rates of 1 m^3/min (graphite furnace) and 5 m^3/min (flame)		
Technical standards and guidelines	Complies with standards for safety and electromagnetic compatibility for CE marking (LVD 2014/35/EU; EMC 2014/30/EU; RoHS 2011/65/EU), ISO 9001 compliant		

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