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Specification Sheet

Atomic Absorption Spectrophotometers

AA-7800 Series

The AA-7800 series Atomic Absorption Spectrophotometers can be configured to meet a wide range of applications. We can build the smallest dual atomizer system by adding a flame analysis system with high analytical performance and safety, and a furnace analysis system with simplicity and high performance. It is possible to analyze various samples at a wide range of concentrations using flexible instrument accessory configurations. In addition, software supports safe and secure data management.

Main Unit

Basics

Optics	Wavelength range	185.0 to 900.0 nm
	Monochromator	Aberration-corrected Czerny-Turner mounting, Number of grating grooves: 1800 lines / mm, Focal length: 300 mm
	Bandwidth	0.1, 0.2, 0.4, 0.7, 1.0, 2.0L nm (6-step automatic switching)
	Detector	Photomultiplier tube
	Optics	• Optical double-beam • Furnace: High-throughput single beam
	Background correction method	• BGC-SR (high-speed self-reversal method) (185.0 to 900.0 nm) • BGC-D2 (D$_2$ lamp method) (185.0 to 430.0 nm)
	Number of HC lamps	• 8 lamps • 2 lamps simultaneously lit (1 for measurement, 1 warming up for next measurement).
	Lamp mode	EMISSION, NON-BGC, BGC-D$_2$, BGC-SR
Data processing	Software requirements	Microsoft Windows 10 Pro (64bit)
	Parameter setting	Wizard method
	Measurement mode	Flame continuous method, flame micro sampling method, furnace method, flame emission method
	Concentration conversion mode	• Calibration curve method (order: 1st, 2nd, 3rd) • Standard addition method, simple standard addition method (order: 1st)
	Repeat analysis	Up to 20 repetitions. Mean value, standard deviation (SD) and coefficient of variation (RSD) display Automatic exclusion of deviant values by setting SD and %RSD
	Baseline correction	Automatic correction of baseline drift by offset correction in peak height / peak area modes.
	Signal processing segment setting	Signal processing segments can be changed in peak height / peak area modes.
	Sensitivity correction	Automatic calibration curve correction function using sensitivity monitoring
	Analog output	2 channels (atomic absorption/energy signal, background signal) Output range: 5.0, 2.5, 1.25, 0.625 Abs./V (each settable in 4 stages) Fixed at 1 V F.S. in EMISSION mode.
	Tabular data processing	Final concentration calculations based on sampled volume, dilution rate, fixed volume, and factor inputs
	Recall of parameters	Template functions available
	Procedure/result display	MRT (Measurement Results Table) worksheet
	Report generation	Summary report
	QA/QC	Select whether to continue or discontinue measurements based on results of evaluation on coefficient of correlation, %RSD, ICV·ICB, CCV·CCB, PB, LCS, SPK, PDS, and DUP.
	Re-analysis	• Prescriptive and intelligent dilution options. • Automatic dilution and re-analysis of unknown samples via autosampler (flame micro sampling method, furnace method)
	Digital recording	• Management by login ID and password • Control user access authority by user level • Log record • Audit trail • Electronic signatures

Power requirements	Choose from 100, 120, 220, or 230 VAC, 230 VA,50/60 Hz (Power is required separately for the personal computer.)
Dimensions and weight	• AA-7800F/AAC: 702 W × 610 D × 702 H mm, 78 kg • AA-7800F: 702 W × 610 D × 702 H mm, 75 kg • AA-7800G: 702 W × 590 D × 520 H mm, 68 kg (Protruding parts and optional equipment are not included.)
Ambient temperature / humidity	10 to 35 °C, 20 to 80% (less than 70% when temperature is higher than 30 °C)

Required Software Operation Environment

The personal computer and monitor specifications are as follows.

Operating system	Microsoft Windows 10 Pro (64 bit)
CPU	Intel® Core i3-6100(3.70GHz) or higher is required.
RAM	4 GB or higher
Monitor	XGA (1280×1024 dots) or higher
Storage device	One CD-ROM drive (for installing a software) Requires 60 MB min. hard disk space for AA installation.
I/O port	One LAN port (for AA control) USB 2.0 port (for optional GFA-TV)
Peripheral device	Monitor, keyboard, mouse, printer

* Notes
• The PC, monitor and printer are not included in the standard configuration. Acquire them separately.
• The ASC-7800, ASK-7800 and GFA-7800 are optional accessories.
• A micro sampling kit is required for the flame micro sampling method.
• Microsoft Windows 10 Pro is a registered trademark of Microsoft Corp., U.S.A.
• The AA-7800 Series does not conform to IEC60601 — Medical Electrical Equipment.

Main Unit

Flame

Burner unit	Type	Air-cooled pre-mix type
	Burner head	Titanium 10 cm slot (5 cm titanium slot for N_2O-C_2H_2 flame available as an option)
	Nebulizer	• Pt-Ir capillary • PTFE orifice • ceramic impact bead (capable of handling hydrofluoric acid)
	Chamber	Engineering plastics
	Positioning	AA-7800F • Lateral/vertical manual adjustment AA-7800F/AAC • Automatic flame/furnace switching by motor • Automatic search of optimum burner height
	Angle adjustment	0 to 90° (Angle adjustment is not possible if the optional GFA-7800 is installed on the AA-7800F/AAC.)
Gas control	Type	Air-C_2H_2 flame, N_2O-C_2H_2 flame (Hydrogen flame is not applicable)
	Flow rate control	• Automatic fuel gas flow rate setting (0.1 L/min step) • Manual support gas flow rate setting • Automatic search of optimum gas flow rate
	Safety measures	• Automatic flame extinction via flame vibration sensor • Acetylene regulator failure sensor • Automatic gas leak check • Automatic Air-N_2O switching as C_2H_2 flow rate increases • Flame monitor • Prevention of incorrect burner head use • Gas pressure monitor • Drain tank level monitor • Automatic flame extinction upon power outage or sudden power interruption • Internal fan stop sensor

Furnace (GFA-7800)

Heating temperature range	• Ambient to 3,000 °C
Heating control system	• Drying: Digital current control with automatic temperature calibration function • Ashing, Atomization: Digital temperature control via optical sensor
Setting heating conditions	• Maximum 20 stages • Heating mode: RAMP/STEP • Inner gas type: Dual automatic switching type • High-sensitivity mode setting • Enrichment in furnace: Maximum 20 times • Optimum temperature program search support function • Inner gas flow rate: 0 to 1.50 L/min
Safety measures	• Cooling water flow rate monitor • Gas pressure monitor • Overcurrent protection unit (double check by circuit protector and optical sensor) • Furnace block cooling check • Heat protection function
Positioning	AA-7800G / AA-7800F • Lateral/vertical manual adjustment AA-7800F/AAC • Automatic flame/furnace switching by motor
Power requirements	200, 220, 230, or 240 VAC ±5%, 7400 VA, 50/60 Hz
Dimensions and weight	230 W × 560 D × 507 H mm, 50 kg

Autosampler

Common Specifications

Control	RS-232C communication control from AA unit
Maximum reagent / sample positions	Reagents: 8 positions Samples: 60 positions (random access available with reagents or samples)
Rinse water bottle	2 L
Power requirements	Choose from 100, 120, 220, or 230 VAC, 50 VA, 50/60 Hz

Flame Continuous Method

Functions	Zero-point detection, auto diagnosis, auto rinse, random access
Sample volume	Sample vials: 15 mL, reagent vials: 53 mL
Nozzle rinse	Solvent rinse aspiration method
Dimensions and weight	Sampler: 340 W × 280 D × 270 H mm, 8 kg Controller (including stand): 230 W × 200 D × 320 H mm, 4.5 kg

Furnace Method / Flame Micro Sampling Method

Functions	Zero-point detection, auto diagnosis, auto rinse, auto mixing, random access
Sample volume	Sample vials: 2 mL, reagent vials: 20 mL
Nozzle rinse	Solvent rinse discharge method
Sampling functions	Dilution function, reagent addition function
Syringe	250 µL
Injection volume	2 to 90 µL
Repeatability	1%RSD (20 µL)
Carryover	Rinse port: Less than 0.0001 Mixing port: Less than 0.00001
Mixing port rinse	Solvent rinse discharge method, solvent discharge and rinse with next sample
Mixing function	Performed in mixing port. Maximum mixture volume: 0.6 mL
Maximum number of mixing reagents added	Up to 4 solutions Number of solutions possible for mixing • Calibration curve method: 5 solutions max. (sample + 4 types of reagents) • Standard addition method: 6 solutions max. (sample + standard solution + 4 types of reagents)
Auto dilution / re-analysis	For measurement result on unknown samples: • If extrapolation of calibration curve is possible: automatic calculation of dilution rate and dilution to bring concentration within calibration curve range • If extrapolation of calibration curve is not possible: dilution rate fixed at 10x
Dimensions and weight	Sampler (including sliding parts): 340 W × 280 D × 400 H mm, 11 kg Controller: 200 W × 110 D × 230 H mm (built into GFA-7800), 4 kg

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