Agilent 140/240/280 Series AA

Productive. Precise. Reliable.

Specifications

Introduction

Agilent 140/240/280 Series AA spectrometers are manufactured according to a quality management system certified to ISO 9001.

Design overview

The Agilent 140/240/280 Series AA comprises:

- 140/240 Series AA
- 240FS/280FS AA with Fast Sequential capability
- 240Z/280Z AA with Zeeman GFAA capability
- Duo AA with simultaneous flame/furnace capability

Design overview

140/240 AA

The 140/240 AA are external PC-controlled Atomic Absorption spectrometers fitted with four lamp positions, choice of manual or automatic lamp selection and automatic or programmable gas control. The 240 AA is a true double-beam spectrometer to ensure a stable baseline. The 140 AA is a single-beam spectrometer, allowing maximum light throughput. Supplied with SpectrAA Base software. The 140/240 Series AA are suitable for manual flame analyses and vapor generation using the VGA 77 Vapor Generation Accessory. Automated flame analyses and graphite furnace analyses are supported with additional accessories. The 240G AA is dedicated to GFAA determinations and includes the GTA 120 Graphite Tube Atomizer and PSD 120.

240FS/280FS AA

The 240FS/280FS AA are external PC-controlled Atomic Absorption spectrometers supporting multi-element flame AA determinations using Fast Sequential analysis for improved sample throughput with flame AA. The 240FS/280FS AA are both true double-beam spectrometers to ensure a stable baseline. Supplied with SpectrAA Base and PRO software. The 240FS/280FS AA are suitable for manual flame analyses and vapor generation using the VGA 77 Vapor Generation Accessory. Automated flame analyses and graphite furnace analyses are supported with additional accessories.

240Z/280Z AA

The 240Z/280Z AA are external PC-controlled Atomic Absorption spectrometers dedicated to Zeeman graphite furnace AA determinations using the GTA 120 Graphite Tube Atomizer and PSD 120 Programmable Sample Dispenser. The 240Z AA is supplied with SpectrAA Base software. The 280Z AA is supplied with SpectrAA Base and PRO software. Automated vapor generation determinations are supported with additional accessories.

AA Duo

Agilent AA Duo systems are external PC-controlled Atomic Absorption spectrometers supporting multi-element flame AA determinations using Fast Sequential analysis for improved sample throughput with flame AA (55B is suitable for manual flame analyses) and dedicated Zeeman graphite furnace AA determinations using the GTA 120 Graphite Tube Atomizer and PSD 120 Programmable Sample Dispenser. Simultaneous flame and furnace operation is supported. The flame AA module is fitted with the integrated SIPS power supply (except the 55B AA). The Zeeman AA module is fitted with an integrated UltrAA lamp control module supporting UltrAA lamp operation in two lamp positions and an integrated furnace viewing camera facilitating real time viewing inside the graphite tube. Agilent AA Duo systems are supplied with SpectrAA Base and PRO software. Automated flame AA and vapor generation determinations are supported with additional accessories.

Agilent 140/240/280 Series AA

Instrument hardware

Optics	
	Narrow beam optics match flame and furnace profiles. Optics mounted on a reinforced flat plate with a fitted cover for protection from dust and vapor. Mirror surfaces are quartz overcoated for enhanced protection. The 240/240FS/280FS AA feature a single beam splitter plus a Rotating Beam Combiner, which alternately passes the sample or reference beam into the monochromator for maximum light transmission. Wavelength range is 185–900 nm.
Monochromator (140/240/240FS/240Z AA)	
	Automated self-calibrating 250 mm focal length Czerny-Turner monochromator with microstepping driver for enhanced resolution. Features a holographic diffraction grating with 1200 lines/mm blazed at 240 nm. Dispersion 3.1–2.3 nm/mm. Software controlled wavelength selection and peaking. Wavelength slew rate 2000 nm/min (240FS AA only). Wavelength repeatability: ±0.04 nm. Selected wide range photomultiplier tube detector (type R446 or type R955 (240Z AA only)) for best signal to noise performance. Automated slit selection. Settings: 0.2, 0.5 and 1.0 nm plus reduced height slit of 0.5 nm for graphite furnace operation.
Monochromator (280FS/280Z AA)	
	Automated self-calibrating 330 mm focal length Czerny-Turner monochromator with microstepping driver for enhanced resolution. Features holographic diffraction grating with 1800 lines/mm blazed at 240 nm. Dispersion 1.6–0.8 nm/mm. Software controlled wavelength selection and peaking. Wavelength slew rate 2025 nm/min (280FS AA only). Wavelength repeatability: ±0.035 nm. Selected high sensitivity wide range photomultiplier tube detector (type R955 covering 185–900 nm or R4332 covering 185–750 nm (280Z AA only)) for best signal to noise performance. Automated slit selection. Settings: 0.1, 0.2, 0.5 and 1.0 nm plus reduced height slit of 0.5 nm for graphite furnace operation.
Lamps	
	Support for four lamps (140/240/240FS/240Z AA) or eight lamps (280FS/280Z AA). Lamps mounted in fixed positions. Fast lamp selection using mirror with either manual (140/240 AA only) or automated selection. Compatible with coded, uncoded or high intensity UltrAA lamps (140/240/240FS AA require optional external control module and looming). 280FS AA features factory-installed looming supporting up to four high intensity UltrAA lamps (280FS AA requires optional external control module). All lamp positions on the 240Z AA support UltrAA lamp operation. An external control module is required. An optional integral control module is available, which supports two UltrAA lamps. 280Z AA features integral control module supporting two UltrAA lamps. Two other lamp positions support UltrAA lamp operation (requires optional external control module). Lamps secured by the base without restraining clips or power cables. Lamps automatically switched off at the end of analysis. Automated pre-warming of next lamp in sequence.

Instrument hardware

Background correction (140/240/240FS/280FS AA)

High intensity deuterium background corrector covering wavelength range 185–425 nm. Corrects up to 2.5 background absorbance. 2 ms response. Electronic modulation with automatic gain attenuation for improved beam balance. Deuterium lamp easily aligned and replaced by the user. Optimized electronic control ensures long lamp lifetime.

Background correction (240Z/280Z AA)

Zeeman background correction available across full wavelength range. Features electronically modulated (twice mains frequency) transverse AC electromagnet with peak field-on strength of 0.8 Tesla during Read period. Less than 5 ms response time between background and atomic measurements with three point polynomial interpolation of background signals for enhanced correction capability with rapidly changing background signals. Corrects up to 2.5 background absorbance. Magnetic field strength PC-controlled over range 0.1–0.8 Tesla, enabling optimization of background correction for enhanced sensitivity and reduced interferences. Magnet field strength locked during measurement minimizing effect of mains voltage variations. Coil sealed against moisture and corrosive vapors and fitted with a magnet temperature interlock for over-temperature protection. Complies with International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines for exposure to time-varying magnetic fields.

Internal air purge

Barb fitting on rear of spectrometer enables connection to a clean, dry air supply for purging the instrument internally. This excludes dust and corrosive vapors, enhancing corrosion protection in rigorous conditions.

Gas control (140/240/240FS/280FS AA)

Automatic gas control (140/240 optional) has preset oxidant flow and manual fuel flow control with flow display using a flow meter. Ignition on air/acetylene with automatic oxidant change-over. Interlocked safety system prevents selection of the nitrous oxide flame if the nitrous oxide burner is not fitted.

Hammer programmable gas control (140/240 optional, 240FS/280FS standard) features software controlled gas flows with automatic setting of gas flows for each element. Ignition on air/acetylene with automatic oxidant change-over. Interlocked safety system prevents selection of the nitrous oxide flame if the nitrous oxide burner is not fitted. Fast response Hammer solenoid valve selects gas flow within 30 ms for rapid regulation and stabilization of selected gas flow.

Instrument hardware

Flame safety system (140/240/240FS/280FS AA)

Separate ignite and flame-off buttons. Ignition only occurs when the ignite button is held. Eight safety interlocks monitor burner type, burner correctly fitted, liquid trap, pressure relief bung, flame shield, flame operation, mains power, oxidant pressure within safety reservoir and deuterium lamp cover. Gas connections to atomization system made directly — there are no loose gas hoses. Separate upper and lower flame shields and a chimney protect the operator against heat and UV radiation from the flame. External adjustment of all burner and spray chamber controls. Violation of any safety interlock either inhibits flame ignition or extinguishes existing flame.

Flame atomization (140/240/240FS/280FS AA)

Universal Mark 7 atomization system supplied as standard. Features a fluorinated high density polyethylene spray chamber compatible with acidic and organic solutions (requires optional organic O-ring kit). 'Twist and lock' assembly ensures simple maintenance. Features a pressure relief bung at the rear of the spray chamber. Removable twin-headed mixing paddles can be positioned in the spray chamber to improve mixing and extend operation with high dissolved solids solutions. An externally adjustable glass impact bead provides tuneable performance for optimum sensitivity and best precision. Optional Teflon bead for use with HF solutions. Integral nebulizer with adjustable flow, inert platinum/iridium capillary and PEEK venturi for corrosion resistance. Integral liquid trap with magnetic float liquid level interlock. Burner constructed from Incoloy alloy with Teflon base for corrosion resistance. Choice of air-acetylene or nitrous oxide-acetylene burners. Manual adjustment of burner height and burner rotation. 280FS AA features automated setting of burner height for each element.

Typical performance (140/240/240FS/280FS AA)

>0.9 Absorbance with precision of < 0.5% RSD from ten 5 s integrations for 5 mg/L Cu standard.

Instrument hardware

Graphite furnace (240Z/280Z AA)

GTA120 Graphite Tube Atomizer features Constant Temperature Zone design for rapid atomization and reduced interferences. Features Dynamic Feedback Temperature Control with cooling water temperature compensation for enhanced temperature accuracy without external sensors. Up to 20 temperature steps per program with temperature programmable from 40-3000 °C. Heating rate is software controlled with maximum ramp rate of 2000 °C/s. Choice of two inert gases with PC-controlled flows. Separate internal and external gas flows. Internal flow is software controlled over range 0–0.3 L/min. Fixed external gas flow of 0.5 L/min. with PC-controlled boost flow of 3.0 L/min. during atomization. Two stage external flows reduce gas consumption and improve tube lifetimes. Typical tube lifetimes exceed 5,000 firings for Cu using an atomization temperature of 2300 °C. Graphite tube enclosed in an inert gas atmosphere by a one piece graphite shroud. Solid titanium furnace workhead features quartz end windows for high light transmission. Rapid release mechanism for easy tube replacement. Tube and electrode firing counters provided.

Furnace autosampling (240Z/280Z AA)

PSD120 Programmable Sample Dispenser provides capacity for up to 50 samples in 2 mL microvials, plus five central 10 mL vessels for blank, standard and modifiers. Automatically prepares up to a 10 point concentration or standard additions calibration from one bulk standard. Premix mode provided for use with manually prepared standards. Automatic addition of up to three chemical modifiers with pre/post or co-injection of the modifier. Automatic over range volume reduction reduces sample volume by a user determined dilution factor enabling re-determination of over range samples. Automatic Tube Condition option to remove contamination when over range samples occur. Preconcentrate samples for enhanced sensitivity using multiple injection up to 99 times. 'Hot Injection' allows injection into a heated tube for faster programs and enhanced precision with organic solvents. Injection temperature programmable from 40–200 °C with programmable injection rate. Dispensing volume variable from 1–70 µL with < 1% repeatability (5–70 µL). Air segmented solution pick-up. 1 L pressurized rinse vessel. Flow through capillary rinse after each injection. Ultra stable mounting mechanism with position lock. Optional high capacity carousel increases capacity up to 130 samples using smaller 1.1 mL microvials, plus up to five central 10 mL vessels for blank, standard and modifiers.

Furnace safety system (240Z/280Z AA)

Three instrument safety interlocks monitor mains power, magnet connected and magnet temperature. Five additional furnace safety interlocks monitor inert gas pressure, cooling water pressure and temperature, graphite tube presence and transformer temperature. Violation of any safety interlock either inhibits Zeeman furnace operation or terminates furnace firing.

Furnace viewing (240Z/280Z AA)

Tube-CAM option (factory fitted into the instrument) allows real time viewing inside the graphite tube. This enables optimization of the dispensing height and allows you to confirm the optimum drying and ashing temperatures during method development, capture still images or record videos during analysis.

SpectrAA Software

SpectrAA BASE software

Based on the award winning worksheet concept, SpectrAA Base software completes an easy-to-use instrument software package. Features wizards that guide users through method and sequence development and method templates for rapid development of commonly used methods.

Methods

- All data, signals (when selected), method and sequence parameters are stored in one worksheet file
- Default conditions for each element recalled automatically on entry of the element symbol
- Measure in Absorption or flame emission using PROMT, Integration, Integrate Repeat, peak height or area, furnace PROMT height or area. Pre-read delay variable from 0–999 s. Up to 20 replicates with read time from 0.1–30 s
- Minimum Signal Facility skips to the next sample if the first measurement is less than the specified minimum reading
- Select a different number of replicates for samples and standards
- Eight least squares calibration algorithms provided including New Rational, Linear, Quadratic and Cubic Fits (through zero or non zero) using up to 10 standards, Calibration Blank and multiple Reagent Blanks. Bracketing Standards and Standard Additions modes also provided
- Calibrations are tested for excess curvature using inflection tests with defined error actions including Stop, Continue in Abs or Switch to Next Method
- Verify calibration fit using goodness of fit data or overlay a Reference Calibration to compare shape and sensitivity
- Programmable recalibration and reslope rates. Reslopes eliminate need for full recalibration
- Signal expansion factor of 0.1–100 available in all calibration modes
- Surface Response Methodology (SRM) auto-optimization routine allows fast, easy auto-optimization of the GFAA ashing and atomization temperatures
- Pre-emptive sampling allows the software to move the probe to the next sample while a reading is in progress to improve productivity by up to 15% using flame autosampling
- Smart Rinse optimizes the rinse time between samples by monitoring wash-out, improving productivity with flame autosampling
- Ten QC tests provided including QC Blank, QC Standard, QC Spike, Matrix Spike, Lab Control Sample, Duplicate, Precision (replicate %RSD), Correlation Coefficient and Detection Limit tests. Selectable error actions include Stop, Flag and Continue; Retry, Flag and Continue; Recalibrate and Repeat or Switch to Next Method. All data is date and time stamped
- Programmable measurement rate for QC tests (counted using solution or replicates)
- Optional PRO software provides extended capabilities designed to meet US EPA and other international compliance standards plus a simple equation editor enabling custom test definition

SpectrAA Software

SpectrAA BASE software

Sequences

- Weight/volume and dilution correction provided. Correction factors can be applied before or during analysis
- Fully editable sample label list allowing random selection of samples by element with option to manually schedule QC tests
- Programmable delay before start of any method for system stabilization
- Optional tube condition or tube clean facility at start of each furnace method.
- Initiate a sequence with measurement of a full calibration, Calibration blank, Reslope or sample
- Sequence options include graphics storage and end of run actions for lamps, flame and alarm.
- Measure up to 999 randomly selected samples for up to 30 methods
- Pause autorun at any time and restart from any method/sample.
- Run priority samples immediately by interrupting the current sequence for measurement of any element/sample combination — the sequence automatically resumes

Analysis & Reporting

- Live data display during analysis selectable from Worksheet, Signal graphics (real time display), Calibration graph or Data log with options to display tool bar, status block and live read-out displays for concentration, mean absorbance, mean background and precision (%RSD)
- Datalog maintains a time based history of all events including instrument parameters, results and any status messages
- Graphic displays support overlay and zoom functions plus cursor readout for absorbance/intensity with time/concentration and temperature.
- Wavelength scanning capability using scan rate variable from 5–250 nm/min
- Post-run processing of GFAA data provided, enabling switching between peak height and area measurements
- Post-run retrospective data editing by masking replicate or solution results for both samples and standards, with option to switch calibration algorithms
- Unit conversion facilities provided enabling calibration using one set of units and sample reporting with user defined units
- LIMS support includes data export to a serial port/file in real time or after run using ASCII and PRN formats. Option to upload sample labels and correction factors prior to analysis
- Support for remote control of the AA by using Microsoft Active X/ OLE technology for bi-directional flow of data directly into other applications running on the desktop
- Wide variety of reporting options with user defined selections including sequential or multi-element formats, calibration data, method parameters, concentration, absorbance, precision, replicate data, background, date/time, correction factors and signal graphics

Accessories

SpectrAA BASE software

Administration

- Usage counters monitor lamp operating hours, sample measurements, furnace firings and SIPS tubing usage to assist with GLP compliance
- Custom Rack Wizard allows definition of custom racks for use with the SPS 3 autosampler
- Optional security system to secure adding/deleting methods, editing methods and sequence parameters, data editing, result deletion, rack definition and software configuration settings using Administrator defined password.
- Context sensitive help with extensive indexing and multimedia content including video demonstrations for ease of use.

SpectrAA PRO software

- Provides additional capabilities for Duo operation (simultaneous flame and furnace operation), Fast Sequential AA operation for fast multi-element flame AA determinations, on-line Internal standard correction capability and additional QC capabilities including the capability to customize QC tests.

Optional software

- CFR version software assists users to achieve compliance with the requirements of the US FDA 21 CFR Part 11 ruling covering audit trails, electronic records and electronic signatures.

Flame autosampling

SPS 3 high throughput autosampler with fast, random access, X, Z, theta arm movement. Capacity for one dedicated standards rack and up to three sample racks. Racks may be exchanged during analysis for unlimited sample capacity. Choice of two standards racks for 11 x 16 mm OD tubes or 6 x 29 mm OD centrifuge tubes. Supplied with 3 x 60 position sample racks for 16 mm OD tubes. A range of low cost, autoclavable, polypropylene sample racks are available for tubes of other dimensions. Custom Rack Wizard allow customization of rack configurations enabling you to use your own rack types. Integral peristaltic pump with speed control provides on demand rinsing of the probe, eliminating carryover. Autosampler set-up includes a visual display showing location of all standards, samples and QC solutions. Optional cover available to prevent contamination or to remove fumes or vapors. The cover can be purged, or connected to an exhaust outlet.

Diluter

Optional precision syringe based Diluter for SPS 3. Performs premixing of samples prior to analysis to reduce settling. Provides automatic online over range sample dilution with user definable dilution and mixing options. Dilutes samples serially until in range, or three dilutions completed with result still over range. Optional Roboprep software enhances capabilities with off-line sample dilution, reagent addition and preparation of single and multi-element calibration standards. Typical dilution error < 2% for a 1:20 dilution to 20 mLs.

Accessories

SIPS on-line dilution

Single pump SIPS 10 and dual pump SIPS 20 provide on-line multi-point calibration for flame AA by dilution of a single bulk standard. Immediate dilution of over range samples with 'Smart Rinse' to eliminate memory effects. SIPS 20 totally automates flame standard addition analyses, adds modifiers, spikes samples on-line and introduces internal standard for on-line correction in Fast Sequential mode.

Enhanced flame sensitivity

ACT 80 Atom Concentrator Tube increases sensitivity of flame AA by 2–3 times for air/acetylene elements.

Lower detection limits

High intensity UltrAA lamps are used instead of conventional lamps where improved detection limits are required. The boost discharge increases emission intensity up to five times and increases sensitivity by up to 40%. UltrAA lamps are powered by a separate external control module, which can support operation of two lamps simultaneously. Fixed boost current eliminates any optimization. Flame instruments require optional external control module and looming. 240Z AA requires external control module.

Hydride generation

Modular continuous flow VGA 77 Vapor Generation Accessory allows fast determination of Hg, As, Se, Sb, Te, Bi and Sn at µg/L concentrations. Typical precision 1–2 % RSD with sample throughput of 60–70 samples/hour. Compatible with the SPS 3 autosampler for automated sampling and unattended analyses with the ETC 60. 'Plug-in' modules can be dedicated to specific hydride chemistries. By changing modules when switching between elements, you can eliminate cross-contamination.

Unattended hydride analyses

Couple the ETC 60 Electrothermal Temperature Controller with the VGA 77 and the SPS 3 autosampler to enable unattended hydride determinations and increase sensitivity by up to 30% compared with flame hydride determinations. Consists of a control unit with built-in touch panel keyboard and workhead with user replaceable cell. Control unit provides element specific temperature programs which can be edited and saved. Thermocouple temperature control from ambient to 999 °C.

Graphite furnace, Furnace autosampling and Furnace viewing

Available as accessories for the 140/240/240FS/280FS AA. Refer to specifications on page 6 for details.

Fume extraction

Furnace viewing and exhaust option mounts on the rear of the sample compartment and removes fumes produced during furnace operation when connected to an exhaust. Features two LEDs and mirror to assist tube and sampler alignment and improve viewing. Safety interlock inhibits furnace operation if mirror is exposed.

Recommended environmental conditions

Instrument storage	
	5–45 °C at 20–80 % relative humidity, non condensing
Instrument operation	
	<853 m, 10–35 °C, 8–80 % relative humidity, non condensing. 853–2133 m, 10–25 °C, 8–80 % relative humidity, non condensing.
Electrical requirements (140/240/240FS,280FS AA)	
	Single phase AC supply with three wire system terminated at an appropriate receptacle. 100/120/220/240 VAC ±10%, 230 VAC +14% -6%, 230 VAC +6% -14% 50/60 Hz.
Electrical requirements (240Z,280Z AA)	
	Two single phase AC supplies required with three wire system terminated at an appropriate receptacle. 208, 220 or 240 VAC ±10% 50/60 Hz. Rated current 15 A. Surge current in excess of the nominal rating (up to 35 A) for approx. 1 s, reducing to about 20 A for up to 10 s, perhaps repeating every 1–2 minutes. The power supply should be on a separate mains circuit protected by delayed action fuses and/or circuit breakers.
Gas requirements for flame operation	
	Air supply: Clean, dry, oil free at pressure of 350 kPa (50 psi). Typical consumption 11–20 L/min. Acetylene supply: Instrument grade (99.0% pure) packaged in acetone at pressure of 75 kPa (11 psi). Typical consumption 1.5–10 L/min. Nitrous oxide: Instrument grade (99.5% pure) at pressure of 350 kPa (50 psi). Typical consumption 11–20 L/min
Fume extraction	
	Spectrometer must be located under an extraction system ducted to an external vent. Minimum flow required is 6 cubic metres/min (200 cfm).
Gas requirements for VGA 77	
	Argon or nitrogen (dry 99.99% argon preferred) at pressure of 300 kPa (42 psi). Required consumption 0.1 L/min.
Gas requirements for GTA 120	
	Argon or nitrogen (dry 99.99% argon preferred) at pressure of 140 kPa (20 psi). Required consumption 0.5–3.8 L/min.
Power requirements for GTA 120	
	Single phase AC supply with three wire system terminated at an appropriate receptacle. 208, 220 or 240 VAC ±10% 50/60 Hz. Rated current 15 A. Surge current in excess of the nominal rating (up to 35 A) for approx. 1 s, reducing to about 20 A for up to 10 s, perhaps repeating every 1–2 min. The power supply should be on a separate mains circuit protected by delayed action fuses and/or circuit breakers.
Cooling water for GTA 120	
	Mains supply or recirculated with flow of 1.5 L/min at 180 kPa (27 psi) and temperature of 25 °C (70 °F). A refrigerated water cooler may be used.

Weights, dimensions and power requirements

Instrument	Weight	Dimensions	Power consumption
	Unpacked, kgs (lb)	W x D x H, cm (in)	VA
140/240 AA	56 (123)	79 x 58 x 59 (31 x 23 x 23)	170
240FS AA	56 (123)	79 x 58 x 59 (31 x 23 x 23)	170
280FS AA	75 (165)	79 x 58 x 74 (31 x 23 x 30)	225
240Z AA	56 (123)	79 x 58 x 59 (31 x 23 x 23)	3500*
280Z AA	61 (134)	79 x 58 x 74 (31 x 23 x 30)	3500*
GTA 120	41 (90)	24 x 60 x 59 (10 x 24 x 23)	3500*
GTA 120 for 240Z/280Z AA	52 (115)	24 x 60 x 59 (10 x 24 x 23)	3500*
PSD120	6 (13.2)	30 x 38 x 31 (12 x 15 x 12.4)	Incl. with GTA
VGA 77	5.5 (12)	32 x 21 x 27 (13 x 8 x 11)	20
ETC 60	5 (11)	26 x 26 x 8 (10 x 10 x 3)	550 max.
SIPS 10/20	9 (20)	28 x 29 x 22 (11 x 11 x 8.5)	80
Electronic control module **		22.5 x 38.5 x 10 (9 x 15.5 x 4)	
UltrAA lamp control module	7.5 (16.5)	24 x 14.5 x 35.5 (9.5 x 5.7 x 14)	150

* The GTA will draw surge currents in excess of the nominal rating (refer to the Pre-installation manual, publication number 8510119300 for further details)

** Installed on rear of spectrometer (not required when instrument has an integrated SIPS power supply)

Agilent 140/240/280 Series AA

Installation requirements

System Installation
For full details of AA installation requirements refer to the Preinstallation manual, publication number 8510119300

Customer support policies

Warranty
Twelve (12) months, though this may vary according to location.
Hardware support period
Seven (7) years from date of last unit manufacture. After this time, parts and supplies will be provided if available.
Software support
Telediagnostic capability is available for some instrument models. Availability of Telediagnostic support may vary according to location. Software upgrades to fix nonconformances or safety problems will be issued free of charge. Software upgrades to add additional functionality will require an additional fee.

Further details

More information
For further information please consult your Agilent office or supplier, or our Web site at www.agilent.com

www.agilent.com/chem

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The Measure of Confidence

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