



# Agilent AA Spectrometer Systems

## Site Preparation Guide



# Notices

## Manual Part Number

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## Safety Notices

### CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

### WARNING

A **WARNING** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a **WARNING** notice until the indicated conditions are fully understood and met.

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# 1 Site Preparation Customer Responsibilities

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This publication contains the information required to successfully prepare a site for an Agilent AA system installation. A copy should be retained for validation purposes. If you have difficulty in preparing for the installation, and for details of operator training courses, contact your Agilent sales or field service representative.

If you have questions or problems in providing anything described in the list below, please contact your local Agilent or partner support/service organization for assistance prior to delivery. In addition, Agilent and/or its partners reserve the right to reschedule the installation dependent upon the readiness of your laboratory.

Should your site not be ready for any reason, please contact Agilent as soon as possible to re-arrange any services that have been purchased.

Other optional services such as additional training, operational qualification (OQ) and consultation for user-specific applications may also be provided at the time of installation when ordered with the system, but should be contracted separately.

If Agilent is delivering installation and familiarization services, users of the instrument should be present throughout these services; otherwise, they will miss important operational, maintenance and safety information.

This manual includes information on these products G8430A, G8430AA, G8431AA, G8432AA, G8433AA, G8434AA, G8435AA, G8436AA, G8437AA, G8442AA, G8447AA, G8448AA, G8449AA, G8450AA, G8438A, G8439A, G8440A, G8443A, G8444A, G8445A.

Report any instrument damage to the company responsible for transporting the instrument. Ensure that an Agilent representative was informed of the damage, and a copy of the damage report has been sent to the Agilent office.

Complete all relevant items below before scheduling your installation.

## NOTE

All information in this manual is accurate at the time of publication. For the most current information, contact your local Agilent representative.

### Software responsibilities

- N/A (Check if 21 CFR Part 11 is not required.)
- The 21 CFR Part 11 booklet has been received and read, and action has been taken to ensure Section 4 of the 21 CFR Part 11 booklet has been completed.
- The System Administrator has been notified.
- Arrangements have been made for the System Administrator to be present during installation.

### Laboratory setup responsibilities

Requirement	<input checked="" type="checkbox"/>
Principal installation area is in compliance with all relevant safety regulations.	<input type="checkbox"/>
PC components on site.	<input type="checkbox"/>
Brand: _____	
Processor: _____ RAM in MB: _____	
Hard disk size in MB: _____ Operating system: _____	
Printer brand: _____	<input type="checkbox"/>
Model number: _____	
Laboratory is free of excessive particulate matter.	<input type="checkbox"/>
Lab temperature maintained between 20 and 25 °C (68 and 77 °F).	<input type="checkbox"/>
Workbench requirements met.	<input type="checkbox"/>
Exhaust system is suitable.	<input type="checkbox"/>
Specified electrical supply and power outlets installed.	<input type="checkbox"/>
All gas supplies (at specified purities), regulators, and gas lines are installed.	<input type="checkbox"/>
Waste container appropriate for the chemical waste is prepared.	<input type="checkbox"/>
Water cooling/circulation system and power connections are set up.	<input type="checkbox"/>
Brand and model number: _____	
Serial number: _____	
Entrance to the lab is at least 1450 cm (57.1 in) wide.	<input type="checkbox"/>
Instrument boxes have arrived undamaged or a copy of any damage report has been forwarded to the Agilent sales office.	<input type="checkbox"/>
<b>Accessories</b>	
SIPS 10/20 Sample Introduction Pump System serial number: _____	<input type="checkbox"/>
SPS Sample Preparation System serial number: _____	<input type="checkbox"/>
VGA 77 Vapor Generation Accessory serial number: _____	<input type="checkbox"/>
GTA Graphite Tube Atomizer serial number: _____	<input type="checkbox"/>
ETC 60 Electrothermal Temperature Controller serial number: _____	<input type="checkbox"/>
Additional accessory serial number: _____	<input type="checkbox"/>
Type and model: _____	
Additional accessory serial number: _____	<input type="checkbox"/>
Type and model: _____	

## Request for installation

Once all preparations listed above have been completed in accordance with the information provided in this document, contact your local Agilent or partner support/service organization to arrange for the installation to be completed as soon as possible.

If the installation site is not prepared in accordance with the enclosed instructions, additional installation charges may apply.

## Installation guidelines

Allow a minimum of four hours for the installation by an Agilent field service engineer. If accessories are included, allow a maximum of 8 hours.

The installation will include:

- Spectrometer installation
- Basic customer training
- Maintenance overview
- Accessory installation

### NOTE

Installation time will increase if qualification services (IQ/OQ) are required. Contact your local Agilent field service engineer for further details.

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## Site Preparation Customer Responsibilities

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## 2 Safety Information

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### General safety

Your Agilent AA instrument and accessories have been carefully designed so that when used properly you have an accurate, fast, flexible and safe analytical system.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Operation of an atomic absorption spectrometer can involve the use of compressed gases, flames, and hazardous materials including corrosive fluids and flammable liquids. Unskilled, improper, or careless use of this instrument can create explosion hazards, fire hazards, or other hazards which can cause death, serious injury to personnel, or severe damage to equipment and property.

Information on safety practices is provided with your instrument and manuals, and also referenced in your Agilent accessory manuals. Before using your instrument or accessories, you must thoroughly read these safety practices.

Observe all relevant safety practices at all times.

The safety practices described in the User's Guides are provided to help you operate the instrument safely. Read each safety topic thoroughly before attempting to operate the instrument and *always* operate the spectrometer in accordance with these safety practices.

### Exhaust and gas safety information

Safety information and requirements for exhaust systems starts in the Exhaust System section on Page 21.

## Safety Information

Safety information, specifications, and storage of gas cylinders starts in the Gas Supplies section on Page 29.

Use the information provided in these sections to ensure your laboratory is set up for your Agilent AA Spectrometer. Also ensure that your laboratory complies with all local and national safety regulations.

## Magnetic field (Zeeman only)

The magnet produces a variable magnetic field of up to 0.8 tesla peak at mains frequency in the workhead during the read stage.

To avoid interference with heart pacemakers or magnetic storage media, keep them at least 300 mm (12 in) from the magnet.



After all safety regulations have been met, check the checklist box: *Principal installation area is in compliance with all relevant safety regulations.*

## Other information

Specific warnings and cautions appear in the manual and in the Help where appropriate, and detail the specific hazard, describe how to avoid it, and specify the possible consequences of not heeding the warning or caution.

### NOTE

A 'Note' message is used to give advice or information.

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# 3 Workbench and Instrument Weight Specifications

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## Workbench

The workbench must be free from vibration, and be stable and strong enough to support the total weight of the equipment to be used. The bench top should be large enough to permit a free circulation of air around the main instrument and each of the accessories. Allow at least 100 mm clearance between instrument panels and walls.

Avoid bench space with overhanging shelves. Pay special attention to the total height and weight of the modules you have ordered to ensure your laboratory bench can support this weight.

The information provided in Table 1 will make planning easier. Portable or semi-permanent trolleys can be used as workbenches, but you must lock the wheels. Accessories such as the SPS 3 and SPS 4 Autosamplers can be positioned on a trolley available from Agilent. To avoid damage from spillage of samples being used, the bench top should be covered with a material that is corrosion-resistant and impervious to liquid spillage. Generally, for comfortable working conditions and ease of access to the instruments, the workbench should be approximately 900 mm (35 in) high.

The location of the workbench may be determined by the need for an exhaust flue to remove fumes and vapors from the spectrometer sample compartment (see Exhaust System on Page 21).

## Dimensions and weights

Table 1. Equipment dimensions and weights for Agilent AA systems

System unit	Width	Depth	Height	Weight
<b>55B AA spectrometer</b>	790 mm (31 in)	585 mm (23 in)	575 mm (22.5 in)	56 kg (123 lb)
55B AA shipping dimensions	1200 mm (47 in)	780 mm (31 in)	870 mm (34 in)	97 kg (213 lb)
<b>240 AA spectrometer</b>	790 mm (31 in)	580 mm (23 in)	590 mm (23 in)	56 kg (123 lb)
<b>240Z AA spectrometer. Also requires GTA 120Z (see below)</b>	790 mm (31 in)	580 mm (23 in)	590 mm (23 in)	56 kg (123 lb)
240 AA shipping dimensions	1215 mm (46 in)	820 mm (35 in)	870 mm (35 in)	97 kg (214 lb)
240Z AA shipping dimensions	1215 mm (46 in)	820 mm (35 in)	870 mm (35 in)	86 kg (190 lb)
<b>280FS AA spectrometer</b>	790 mm (31 in)	580 mm (23 in)	590 mm (29 in)	75 kg (165 lb)
<b>280Z AA spectrometer. Also requires GTA 120Z (see below)</b>	790 mm (31 in)	580 mm (23 in)	740 mm (29 in)	61 kg (135 lb)
280FS/Z AA shipping dimensions	1210 mm (48 in)	820 mm (32 in)	1020 mm (40 in)	106 kg (234 lb)
<b>GTA 120 Graphite Tube Atomizer (workhead stowed)</b>	240 mm (10 in)	600 mm (24 in)	580 mm (23 in)	41 kg (90 lb)
<b>GTA 120 shipping dimensions (including PSD 120)</b>	960 mm (38 in)	770 mm (30 in)	850 mm (34 in)	76 kg (167 lb)
<b>GTA 120Z (including workhead)</b>	240 mm (10 in)	600 mm (24 in)	580 mm (23 in)	52 kg (115 lb)
GTA 120Z shipping dimensions (including PSD 120)	960 mm (38 in)	770 mm (30 in)	850 mm (34 in)	87 kg (192 lb)
<b>PSD 120 Programmable Sample Dispenser</b>	300 mm (11.8 in)	380 mm (15 in)	310 mm (12.2 in)	6 kg (13.2 lb)
PSD 120 shipping dimensions	660 mm (26 in)	420 mm (16.5 in)	310 mm (12.2 in)	10 kg (22 lb)
<b>SPS 4 Autosampler</b>	600 mm (23.6 in)	363 mm (14.3 in)	510 mm (20.1 in)	15 kg (33.1 lb)
SPS 4 shipping dimensions	812 mm (32.0 in)	532 mm (20.9 in)	714 mm (28.1 in)	18.6 kg (41.0 lb)
SPS 4 trolley dimensions	580 mm (23 in)	412 mm (17 in)	400 mm (16 in)	8.4 kg (18.5 lb)
SPS 4 trolley shipping dimensions	764 mm (30.1 in)	518 mm (20.4 in)	203 mm (8.0 in)	11 kg (24.3 lb)
<b>VGA 77 Vapor Generation Accessory</b>	310 mm (13 in)	210 mm (8 in)	270 mm (11 in)	5.5 kg (12 lb)
VGA 77 shipping dimensions	590 mm (23 in)	475 mm (18 in)	320 mm (12 in)	11 kg (24 lb)
<b>UltrAA Boosted Lamp Supply</b>	240 mm (9.5 in)	355 mm (14 in)	145 mm (5.8 in)	7.5 kg (17 lb)
<b>ETC 60 Electrothermal Temperature Controller</b>	260 mm (10 in)	240 mm (9.5 in)	150 mm (6 in)	5 kg (11 lb)
ETC 60 shipping dimensions	385 mm (15 in)	340 mm (14 in)	400 mm (16 in)	8.5 kg (19 lb)
<b>SIPS 10/20 Sample Introduction Pump System power module</b>	225 mm (9 in)	100 mm (4 in)	385 mm (15.5 in)	4.5 kg (10 lb)
SIPS 10/20 pump module	285 mm (11 in)	275 mm (10.5 in)	215 mm (9 in)	4.5 kg (10 lb)
SIPS 10/20 shipping dimensions	620 mm (25 in)	530 mm (21 in)	360 mm (14 in)	15 kg (33 lb)

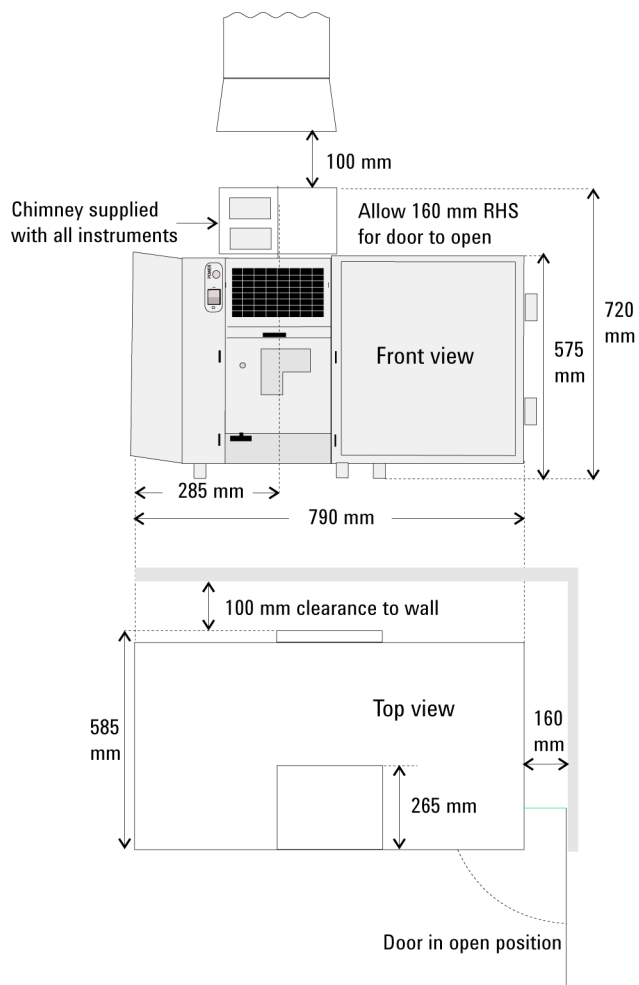
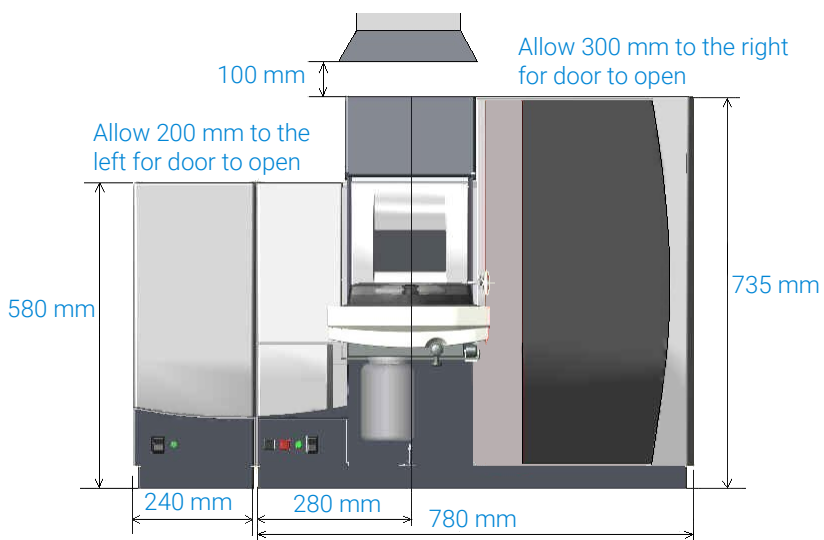
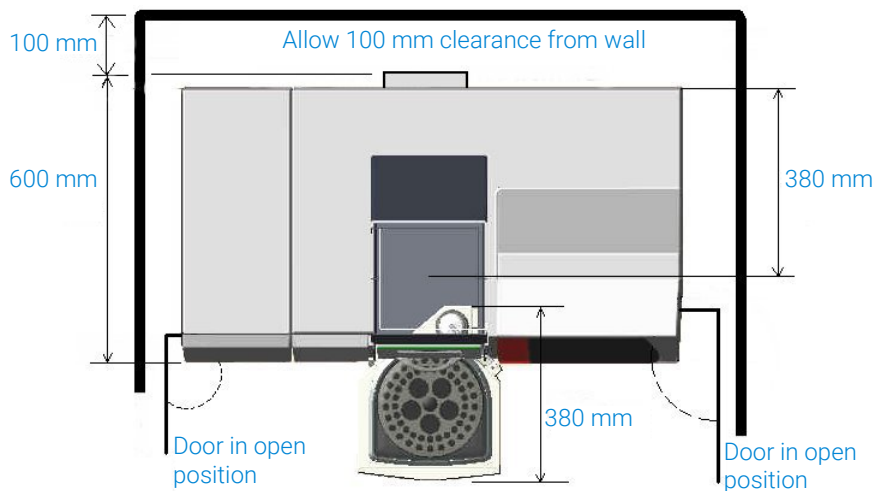


Figure 1. Dimensions of Agilent 55B AA spectrometer

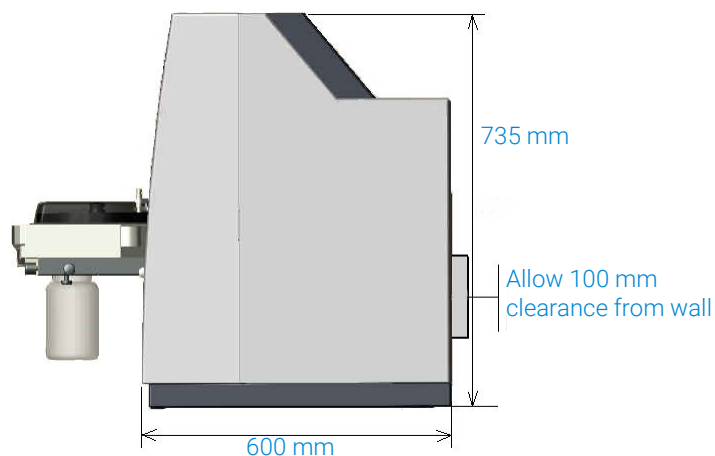
## Workbench and Instrument Weight Specifications



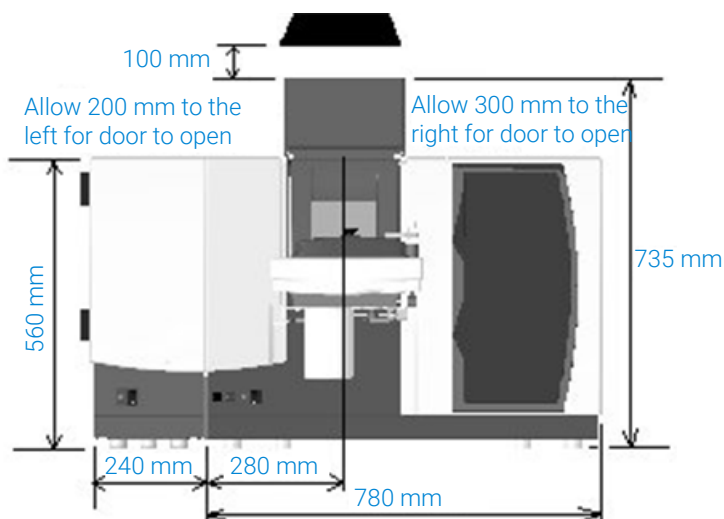
**Figure 2.** Dimensions of Agilent 280 AA spectrometer with GTA 120 and PSD 120 (front view)



**Figure 3.** Dimensions of Agilent 280 AA spectrometer with GTA 120 and PSD 120 (top view)

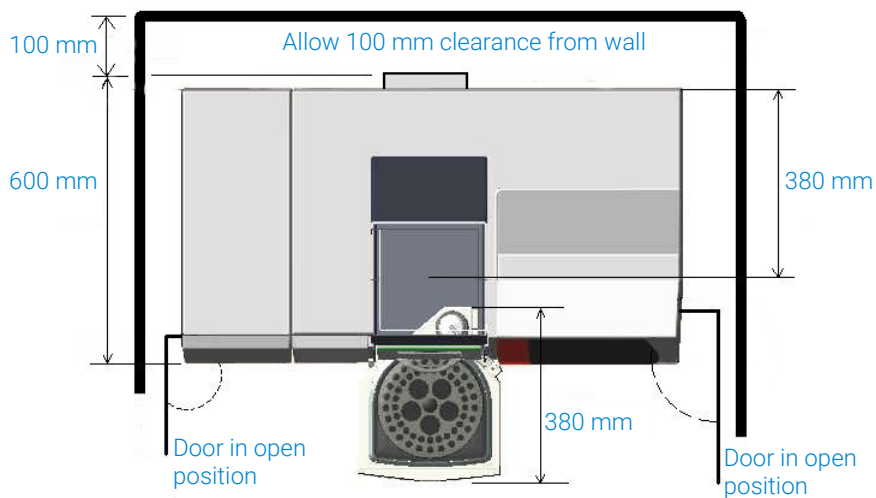


**Figure 4.** Dimensions of Agilent 280 AA spectrometer with PSD 120 (side view)

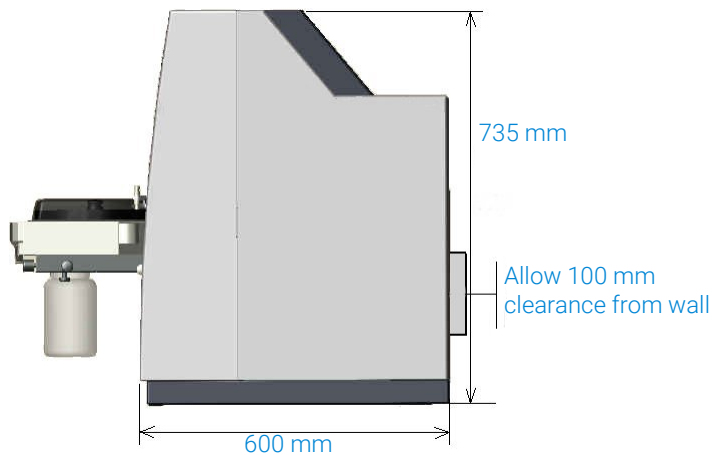


**Figure 5.** Dimensions of Agilent 240 Series AA spectrometer with GTA 120 and PSD 120 (front view)

## Workbench and Instrument Weight Specifications

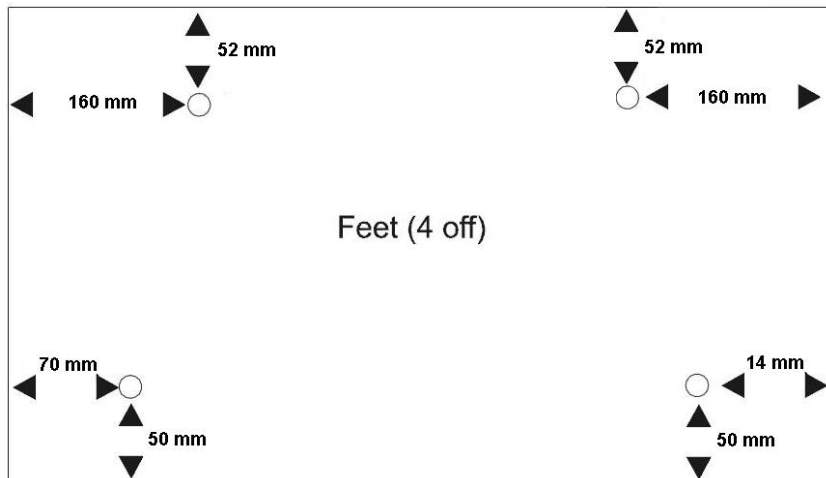


**Figure 6.** Dimensions of Agilent 240 Series AA spectrometer with GTA 120 and PSD 120 (top view)



**Figure 7.** Dimensions of Agilent 240 Series AA spectrometer with PSD 120 (side view)





**Figure 8.** Feet location on the base of Agilent 240/280 Series AA (including Zeeman) spectrometer



After the workbench vibration and location requirements have been met, check the checklist box:  
*Workbench requirements met.*

## Workbench and Instrument Weight Specifications

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## 4 Laboratory Environment

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### Suitability

#### Equipment class

Your Agilent AA instrument is designed for indoor use only and is classified suitable under Equipment Class I category.

#### Installation category

The installation category is II, based on IEC61010-1. The installation category implies the regulation for impulse withstand voltage. It is also called the 'Over voltage category'. 'II' applies to electrical equipment with a nominal supply voltage up to 300 V.

#### Pollution level

The pollution level is 2, based on IEC61010-1. Pollution level describes the degree to which a solid, liquid, or gas that deteriorates dielectric strength is adhering. '2' applies to a normal indoor atmosphere, where only nonconductive pollution occurs.

### Environmental conditions

Operating your instrument within the recommended cleanliness and temperature and humidity ranges ensures optimum instrument performance and lifetime.

## Laboratory Environment

### Cleanliness

- The area selected for operation of an Agilent AA spectrometer system must be free from drafts, corrosive atmospheres and vibration.
- Sample preparation areas and materials storage facilities should be located in a separate room.
- The area should have a dust-free, low-humidity atmosphere.
- Air conditioning is strongly recommended for control of the environment.
- The instrument should not be located near a window, door or any other area where drafts may cause unstable thermal conditions.



After the cleanliness requirements have been met, check the checklist box: *Laboratory is free of excessive particulate matter.*

### Temperature, humidity, and altitude

Table 2. Recommended environmental conditions for Agilent AA spectrometers

	Altitude	Temperature range	Relative humidity (non-condensing)
For operation	0 to 853 m (0 to 2800 ft)	10 to 35 °C (50 to 95 °F)	8 to 80%
	853 to 2133 m (2800 to 7000 ft)	10 to 25 °C (50 to 77 °F)	8 to 80%
For storage	0 to 2133 m (0 to 7000 ft)	5 to 45 °C (40 to 115 °F)	20 to 80%

#### NOTE

For *optimum analytical performance*, it is recommended that the ambient temperature of the laboratory be between 20 and 25 °C (68 and 77 °F) and be held constant to within  $\pm 2$  °C ( $\pm 3.6$  °F) throughout the entire working day.



After the temperature requirements have been met, check the checklist box: *Lab temperature maintained between 20 and 25 °C (68 and 77 °F).*

### Noise levels

The sound pressure level (SPL) of a flame AA in a 'normal' laboratory environment ( $\approx 60$  dBA) ambient noise measured at normal operator position is  $\approx 65$  dBA. At a distance of 1 meter from the instrument, the SPL is reduced to  $\approx 62$  dBA. The likely maximum SPL at a customer location will be greatly influenced by the extraction system.

## 5 Laboratory Facilities

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### Exhaust system

Heat, vapors and fumes generated by flame, furnace and vapor generation methods can be toxic or corrosive and may be hazardous to personnel and must be extracted from the instrument by an exhaust system.

The customer is responsible for installation of the extraction system prior to the installation of the AA spectrometer system by Agilent.

#### Exhaust temperatures

The flame operates at a temperature of approximately 3000 °C (5400 °F), and can generate up to 540 kilojoules (510 Btu) per minute.

Under extreme flame conditions, the maximum temperature of the exhaust extraction system (based on the Agilent exhaust system) is 65 °C (149 °F) at a distance of 2.2 m (7.2 ft) above the floor level. However, failure of the extraction fan may cause accessible metalwork to become dangerously hot.

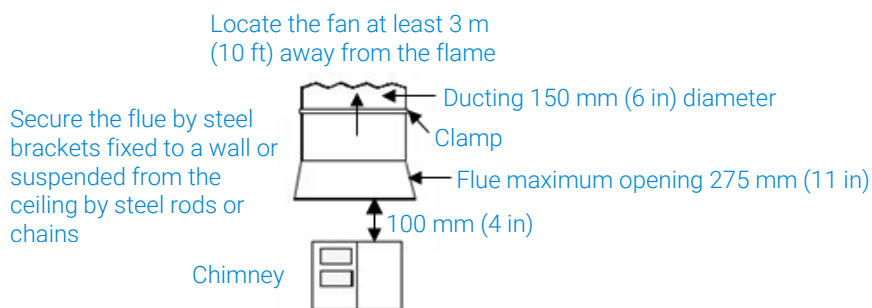


Figure 9. Spectrometer and flue position

### Exhaust system requirements

The exhaust system construction and installation must comply with any rules and/or regulations that may be imposed by local authorities responsible for control of facilities and fixtures in the workplace.

The spectrometer must be located under a flue, which is vented by an exhaust fan and ducted to an external vent that vents to the outside air; never within the building. The external vent must be fitted with a backdraft damper. Locate the system outlet such that the exhaust cannot re-enter the building through any door, window, air conditioning inlet, or other ventilator.

The exhaust system with flue, ducting and external vent must provide a minimum flow of 6 cubic meters per minute (200 cfm) at 16-mm water gauge static pressure (free delivery of 11 cubic meters per minute; or 388 cfm).

The exhaust fan should be located at least 3 meters (10 feet) away from the flame. The fan blades must be made of metal. The fan control switch and running indicator lamp should be located close to the instrument. The motor must be mounted away from the hot gases, and plastic parts must not be used as they will melt.

Ducting must be corrosion-resistant and fire-proof, and should be kept clear of fire alarms, sprinkler heads, heat-sensitive devices and combustible materials. It should rise vertically for at least 2 meters (6 feet) from the spectrometer and there should be no tight bends. All ducting joints must be fitted – the hot exhaust gases may melt soldered joints.

---

#### WARNING



#### Noxious Gas

**Any leak can result in an oxygen-deficient atmosphere, which can cause death, serious injury, asphyxiation, anesthetic effects, and serious damage to equipment and property. An exhaust system must be used with Agilent AA flame and furnace instruments, to remove hazardous and toxic gases.**

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#### NOTE

The Agilent Furnace Fume Extraction System accessory requires an exhaust ducting size of 150 mm (6 in) to fit the mounting plate.

### Agilent exhaust system

The components required for an extraction system may be purchased from Agilent either separately or as a kit of parts ready for installation at the instrument

site. To allow for personal preferences in the selection of control gear, switch and pilot light assemblies are not included with the items supplied by Agilent.

**Table 3.** Agilent exhaust kits

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**Exhaust kit**

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Exhaust kit for 240 V, 50 Hz supply

Exhaust kit for 115 V, 60 Hz supply

**NOTE**

Mounting hardware for the flue and fan are not included with the Agilent-supplied exhaust kit.

---

The Agilent-supplied exhaust kit *must* be installed by local fitters before the Agilent field service engineer is called.



After the exhaust requirements have been met, check the checklist box: *Exhaust system is suitable.*

## Electrical power supplies

The installation of electrical power supplies must comply with the rules and/or regulations imposed by the local authorities responsible for the use of electrical energy in the workplace.

All Agilent AA instruments are supplied with a 2-meter (6 ft, 6 in) mains power cord terminated as indicated in Table 8.

All power supplies should be:

- Single phase AC, 3-wire system (active, neutral and ground, or two actives and ground)
- Terminated at an appropriate connection receptacle that is within reach of the system power cable assembly.
- In areas where 208/220/240 volt supplies are not normally available in a single phase configuration, supplies may be taken from two phases and ground of a three phase system.

### Other power requirements

- A separate connection receptacle should be provided for each unit in the system (see Table 4).
- Do not use double adapters or extension cords.
- For Furnace instruments, a separate mains circuit individually protected by fuses or circuit breakers must be used for the GTA accessory. It is preferable for the GTA and the instrument to share the same phase.

#### NOTE

If the system being installed is a Zeeman system, then two separate mains circuits individually protected by fuses or circuit breakers must be used – one each for the instrument and the Zeeman GTA accessory. It is preferable for the GTA and the instrument to share the same phase but separate power supply circuits.

Avoid using power supplies from a source that may be subject to electrical interference from other services (large electric motors, elevators, welders and air conditioning units, and so forth).

**Table 4.** Electrical specifications for Agilent AA systems

System unit	Required supply voltage	Rating
55B AA spectrometer	100, 120, 220 or 240 VAC, 50/60 Hz	170 VA
240 AA spectrometer	100, 120, 220 or 240 VAC, 50/60 Hz	170 VA
280 AA spectrometer	100, 120, 220 or 240 VAC, 50/60 Hz	230 VA
240 Z AA spectrometer	208-240 VAC, 50/60 Hz	1000 VA*
280 Z AA spectrometer	208-240 VAC, 50/60 Hz	1000 VA*
GTA Graphite Tube Atomizer (GTA 120)	208/220/240 VAC, 50/60 Hz	15 A*
SIPS 10/20 Sample Introduction Pump System	100-240 VAC	70 W
SPS 4 Autosampler	100-240 VAC, 50/60 Hz	24 VDC, 2.5 A
VGA 77 Vapor Generation Accessory	100, 120, 220 or 240 VAC, 50/60 Hz	20 VA
ETC 60 Electrothermal Temperature Controller	110-120, 220-240 VAC, 50/60 Hz	755 VA maximum
UltrAA Boosted Lamp Supply	100, 120, 220 or 240 VAC, 50/60 Hz	150 VA

\* In normal operation, the Zeeman and GTA units will draw surge currents in excess of the nominal rating. Power supplies to these units must be isolated from other supplies to the system, and should include delayed action protection devices such as circuit breakers or motor start fuses.



The VA and current figures above are the typical continuous VA and current drawn by AA and GTA. During the atomize cycle, surge currents for very short spans of time (between 1 and 5 second) may be drawn by AA (up to 48 A) and by GTA (up to 40 A).

**Table 5.** Agilent AA spectrometer power connections

Plug supplied	Standard	GTA 120 or Zeeman
Australia -00	10 A, 250 VAC. Complies with AS3112.	Clipsal 439D15M
USA -01	Complies with NEMA 5-15P	Complies with NEMA L6-30P (Hubbell #2621)
Canada -01	Complies with NEMA 5-15P	20 A, 250 VAC. Complies with NEMA L6-20P (Hubbell #2321+).
Europe -02	Perena 3410. Complies with CEE 7 Sheet VII or NFC 61.303.	Kaiser CEBEC 616 VDE. Complies with DIN 49441R2.
<b>Required wall socket type</b>		
Australia -00	General purpose 10 A 250 V outlet (HPM 787, Clipsal 15)	Dedicated circuit, 15 A 250 V outlet (HPM 787/15, Clipsal 15/15)
USA -01	Complies with NEMA 5-15R (15 A supply) (Hubbell IG 5262)	Complies with NEMA L6-30R (30 A supply) (Hubbell #2626)
Canada -01	Complies with NEMA 5-15R (15 A supply) (Hubbell IG 5262)	20 A, 250 VAC. Complies with NEMA L6-20R (Hubbell #2326+)
Europe -02	Complies with CEE 7 standard No.7 Sheet VII, or Norma Francais C61.303 Sheet V.A.	No standard known (Kaiser CEBEC 702 type 31/131.5)
Power supply, current rating and overload protection	Between 5 and 20 A	Between 30 and 40 A
Power supply	Single phase	Single phase



After the electrical requirements have been met, check the checklist box: *Specified electrical supply and power outlets installed.*

## Water cooling system

The Graphite Tube Atomizer must have a supply of cooling water to remove heat from the furnace workhead.

Agilent AA flame operation does not require cooling water.

**Table 6.** GTA water cooling system specifications

Parameter	Specification
Required flow rate	1.5 L/min at 180 kPa (27 psi)
Maximum pressure	200 kPa (30 psi)
Recommended inlet temperature	18 to 25 °C (64 to 70 °F)
Maximum temperature	40 °C (104 °F)
Minimum temperature	10 °C (50 °F)

A suitable regulator is included in the GTA 120 control unit. It will be adjusted, if necessary, by the customer support representative. Pressure regulation is recommended for supplies that may exceed the maximum permissible pressure.

The temperature of the furnace coolant is detected by an interlock device, which will stop operation if the cooling water reaches 40 degrees Celsius (104 °F). Where the ambient temperature is high or where a low-capacity water cooling system is used, you may need to include some form of heat exchanger to maintain the recommended water inlet temperature. Any such installation must be capable of extracting 950 W at 20 °C de-rated by 17% for 50 Hz operation.

Provided that the flow rate can be maintained above 1.5 liters per minute and there is no backpressure at the outlet, the cooling water supply may be taken from an in-house domestic water system, if local regulations permit.

An alternative is to install a small recirculating system, which should have a tank capacity of at least 100 liters (27 gallons). The tank should be covered to prevent contamination by dust and other impurities and to minimize evaporation loss. Algicide should be used.

A refrigerated water cooler has the advantage of not needing a large held volume of water. There are many types available. When choosing a water cooler, check that the specifications meet the requirements of the GTA. The preferred cooling system is the Agilent Chiller (G8481A), filled with Poly-Clear Fluid (G3292- 80010).

Your local Agilent office or representative may be able to supply a suitable refrigerated water cooler for use with the Agilent GTA. Contact your local office or representative for details if required.



After the water cooling requirements have been met, enter the requested information and then check the checklist box: *Water cooling/circulation system and power connections are set up.*

## Waste fluids

The Agilent AA flame instrument atomizes only a small percentage of the sample taken up. The excess liquids from the spray chamber must be drained into a waste vessel. Suitable tubing is supplied with the spectrometer for use with inorganic solvents. If you use organic solvents, you will need different tubing, suitable for the solvent(s) of choice.

The Agilent AA instrument also needs a drain or a sump for disposal of waste liquid during rinse cycles when flame or furnace autosamplers are used.

A chemically-inert container, not glass and not narrow-necked, to hold approximately 2 liters (4 pints) of waste must be provided by the instrument user. It should be located underneath the sample compartment (or on the side to the right of the spectrometer), where it is protected by the bench and in full view of the operator.

### Special arrangements for use with organic solvents

If organic solvents are used in a flame system, the following special option fittings are recommended.

**Table 7.** Optional fittings for organic solvent waste fluids

<u>Item</u>
Kit, O-rings (Organics)
Tube, butyl, 9 mm ID, 15 mm OD (1 m length)

A suitable outlet for the liquid trap vent pipe must also be provided. A venting tube should be connected to the vapor vent (the upper nipple) on the liquid trap when you are analyzing organic or toxic liquids. This tubing should be led out from the sample compartment, parallel to the drain tubing, and *must* slope downwards to enable any liquid overflow to drain out and prevent the tubing from becoming blocked. Do *not* lead the vapor tube to the waste vessel.

## Laboratory Facilities

Note the following:

- The venting tube cannot be routed upwards within the sample compartment, because the heat from the flame will melt it.
- If organic vapors are vented to the exhaust system, they may be ignited by the flame and so cause damage to the exhaust system.
- Local environmental protection laws may prohibit toxic vapors from being discharged in to the general atmosphere or into a working area.
- If necessary, an active exhaust system should be used to draw away toxic vapors and neutralize them. If you are not analyzing solutions of an organic or toxic nature, leave the vapor outlet on the spray chamber uncovered.



After the waste fluid container requirements have been met, check the checklist box: *Waste container appropriate for the chemical waste is prepared.*

## 6

# Gas Supplies

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Flame AA spectrometer gas supplies	33
Gas supplies for Graphite Tube Atomizers (Zeeman and non-Zeeman)	39
Gas supplies for the Vapor Generation Accessory	40

## General compressed gases and cylinders information

All gas supply installations must comply with rules and/or regulations that are imposed by the local authorities responsible for the use of compressed gas energy in the workplace. The following points should be considered.

### WARNING



#### Asphyxiation Hazard

**All compressed gases (other than air) can create a hazard if they leak into the atmosphere. Even small leaks in gas supply systems can be dangerous. Any leak (except that of air) can cause an explosion hazard, a fire hazard, or result in an oxygen-deficient atmosphere. Such hazards can cause death, serious injury, asphyxiation, anesthetic effects, and serious damage to equipment and property. Cylinders must be stored and handled strictly in accordance with local safety codes and regulations.**

Ensure that all cylinders are clearly labeled so that there can be no doubt about the contents. If the cylinder label is not legible, do not use the cylinder – return it to your supplier. Always ensure that you have the correct cylinder before connecting the cylinder to the instrument.

If air is supplied from a compressor, all moisture must be extracted from the air before it is supplied to the gas control module. Moisture can affect the internal

## Gas Supplies

components of the gas control system and create a potentially hazardous situation.

Use only approved regulators and hose connectors.

Never attempt to refill cylinders.

Remember that for cylinder connections, left thread fittings are used for fuel; right thread fittings are used for support gases.

## Pressure cylinder storage

All cylinders must be used and stored only in a vertical position. Cylinders containing gas under pressure should be firmly secured to a rigid structure, and the storage area must be adequately ventilated to prevent toxic or explosive accumulations. Move cylinders only on a properly constructed trolley.

Acetylene cylinders should always be stored and moved in an upright position to avoid acetone saturation of the fibrous safety disc and acetone contamination of the acetylene flow. Acetone contamination *will* cause erratic analytical results and *may* damage the instrument. Such damage is *not* covered by the instrument warranty.

Never locate gas cylinders near a source of ignition, or in a position that is subject to direct heat. Gas storage cylinders often incorporate a pressure release device, which will discharge the gas at a pre-determined temperature, usually around 52 °C (125 °F). See **Figure 10**.

## Gas connection fittings

If gases are to be plumbed from a remote storage area to the instrument site, ensure that the local outlets are fitted with stop-valves and pressure gauges that are easily accessible to the instrument operator. Stop valves *must* be rapid action shutoff and should be mounted near the side of the instrument, not behind it, and *never* near or above the sample compartment. The gas outlets must be provided within 1.5 m (5 ft) of the instrument. See **Figure 11**.

If a pressure regulator is used at a local outlet, it is necessary to ensure that its input pressure is always at least 40% greater than its output pressure, under all

combinations of input pressure and gas flow. The effect of supplying multiple instruments through long supply pipelines must be taken into consideration.

Gas fittings may vary among suppliers. If you have difficulty obtaining the correct fittings for *direct* connection of gas supplies to the spectrometer, contact Agilent for assistance. Use only correctly matched fittings. Do not use PTFE tape to fit non-matching fittings together. Use only 3/8-in tube or 1/2-in pipe to minimize pressure drop. See the Air supply (Page 33), Nitrous oxide supply (Page 35), and Acetylene supply (Page 36) sections for fittings specifications.

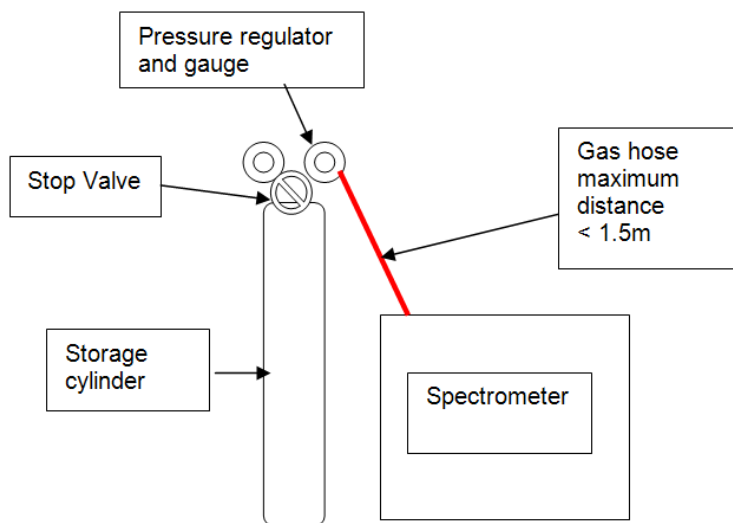


Figure 10. Direct gas connection

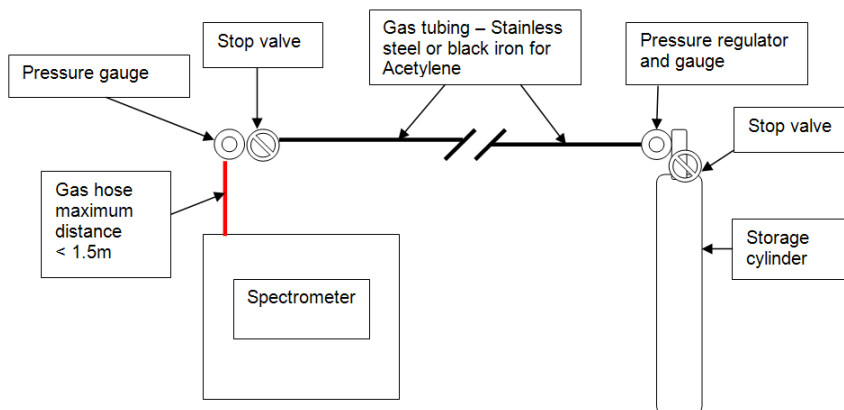


Figure 11. Remote storage location gas connection

### Gas line diameter

All gases should be supplied through gas lines with an internal diameter no smaller than 6.4 mm (1/4 in).

### Permitted gas supplies

**Table 8.** Instrument and accessory gas types

Instrument/Accessory	Gas type	Specifications
Flame instruments**	Air	See Page 33
	Nitrous Oxide	See Page 35
	Acetylene	See Page 36
Furnace instruments	Air	See Page 33
	See GTA Accessory for gas requirements	
GTA accessory	Argon	See Page 39 for all GTA gas specifications
	Nitrogen	
	Air as an alternate gas	
VGA accessory	Argon	See Page 40 for all VGA gas specifications
	Nitrogen	

\*\*Agilent will *not* install a flame instrument where other gases may be provided for connection to it.

Only three gases are specified for use in a flame instrument. They are air, nitrous oxide and acetylene. Agilent will *not* install a flame instrument where other gases may be provided for connection to it. The GTA accessory requires an inert gas (argon or nitrogen), and can use air or other gases as an alternate gas, but does not use nitrous oxide and acetylene.

In planning your gas reticulation scheme, observe the following points:

- *Never* run rubber tubing through a wall or across a floor.
- *Never* use rubber tubing outdoors.
- Acetylene tubing *must* be stainless steel or black iron.
- Use only *refrigeration-grade* copper pipe for other gases – plumbing-grade has oil and grease residues.
- Do *not* cut off the factory-fitted hose connectors. These are needed to connect to test equipment gas-handling jigs. Their removal will cause extra expense during service calls.
- Fit pressure gauges on a wall at the supply point, and ensure that they are visible to the operator.
- Place cutoff valves in a position that can be reached safely in case of a fire.



## Flame AA spectrometer gas supplies

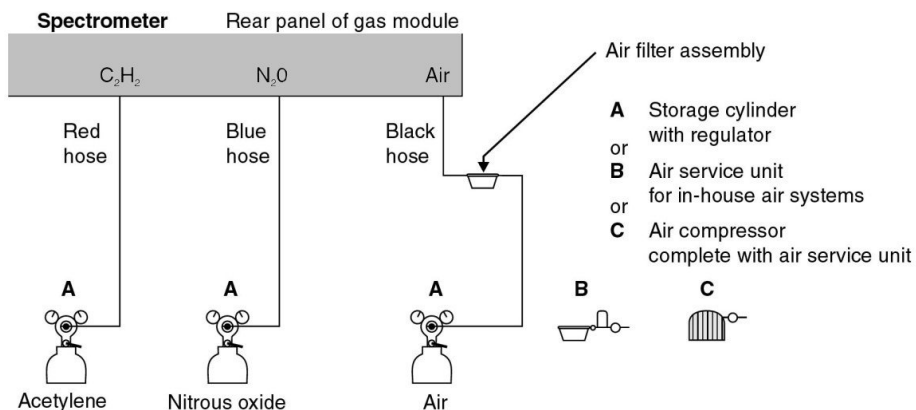


Figure 12. Flame AA spectrometer gas supplies

### WARNING



#### Fire and Explosion Hazard

Fire and/or explosion hazard, which could result in death or serious injury to personnel and damage to property. Agilent AA instruments are designed for flame operation only with acetylene and air, or acetylene and nitrous oxide. The use of unspecified gases for flame operation of the spectrometer is extremely hazardous. Use only the specified gases, and ensure that the installation complies with the relevant rules and regulations as laid down by the appropriate authorities in your region. Never use oxygen or oxygen-enriched air as the oxidant, because this will result in an explosion. Never use any gas except acetylene as the fuel gas.

### Air supply

Table 9. Flame AA spectrometer air supply specifications\*

Parameter	Specification
Quality	Clean, dry, free of oil
Permissible pressure range	245 to 455 kPa (35 to 65 psi)
Recommended pressure	350 kPa (50 psi)
Normal flow rate	13.5 to 20 L/min

\*See Gas supplies for Graphite Tube Atomizers (Zeeman and non-Zeeman) on Page 39 for GTA air supply specifications.

**WARNING****Fire and Explosion Hazard**

Fire and/or explosion hazard, which could result in death or serious injury to personnel and damage to property. Air enriched with oxygen, or pure oxygen, must *never* be used with a flame instrument, as it will cause a flashback.

---

Instrument supply hoses come attached to the instrument and are color coded - black for air. The instrument air hose is fitted with a US Standard Compressed Air Connection, Female Union, Size 9/16 in - 18 UNF. The hose is 1.8 m (6 ft) long. Connection adapters are supplied to suit different locations, as illustrated in **Figure 13**.

The air supply must be regulated to maintain the instrument operating pressure over the full range of normal flow rates. A dual-stage regulator should be used. This is most important for instruments with programmable flow rates because a slow response from the regulator may cause the instrument to shut down during a demand for increased flow. A shutdown of this kind is safe and does not imply a fault in the instrument, but will interrupt your work.

If you choose to use an air compressor, it must be installed in a remote location where its intake is fed from a dry, dust and vapor-free environment. The control switch and pilot light should be mounted close to the instrument.

Where the air supply is derived from a general purpose in-house system or from a *dedicated* air compressor, a filter unit *must* be installed. If your location has high humidity, the air supply should include a dryer or condenser device.

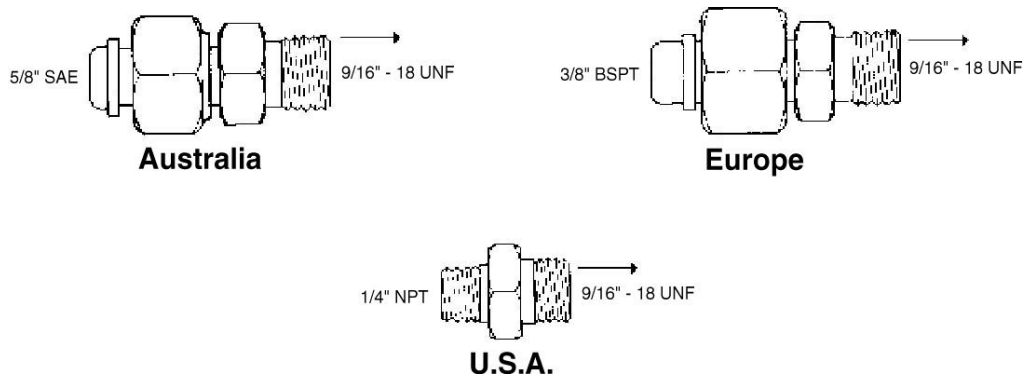


Figure 13. Air supply connection adapters

Table 10. Air supplies

**Description**

230 V 50 Hz Compressor with Air Service Unit  
 115 V 60 Hz Compressor with Air Service Unit  
 Air Service Unit (includes air filter, pressure regulator and emergency air reservoir)  
 Air filter maintenance kit

### Nitrous oxide supply

The nitrous oxide supply must be regulated to maintain the instrument operating pressure over the full range of normal flow rates. A dual-stage regulator should be used. This is most important for instruments with programmable flow rates because a slow response from the regulator may cause the instrument to shut down during a demand for increased flow. A shutdown of this kind is safe and does not imply a fault in the instrument, but will interrupt your work.

The decompression of high pressure  $N_2O$  gas at the regulator can cause excessive cooling and eventual freezing of the regulator. To prevent regulator malfunction and possible flashback, the gas should be heated with an in-line or wrap-around heater. Your Agilent sales and service office can advise you and can supply these devices.

Table 11. Flame AA spectrometer nitrous oxide supply specifications

Parameter	Specification
Quality	Instrument-grade, 99.5% pure (minimum)
Permissible pressure range	245 to 455 kPa (35 to 65 psi)
Recommended pressure	350 kPa (50 psi)
Normal flow rate	11 to 16 L/min

## Gas Supplies

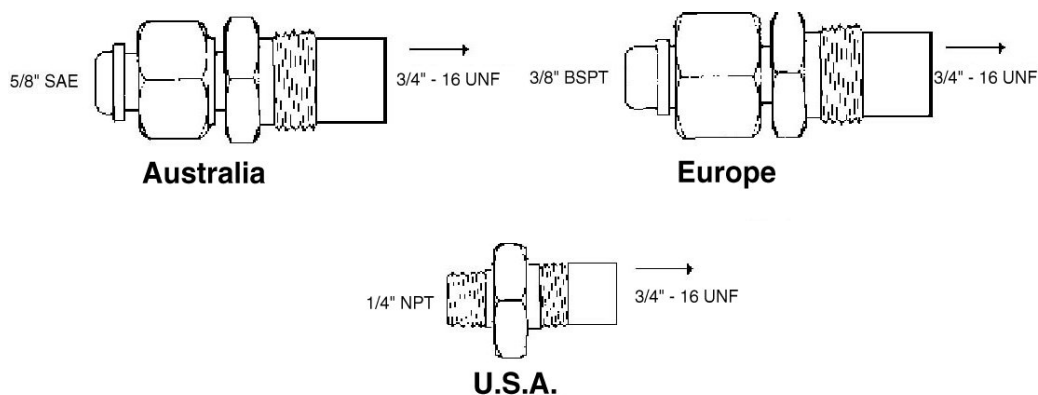
### NOTE

Instrument-grade nitrous oxide must be used. If you choose to use industrial-grade, instrument performance is not guaranteed.

Instrument supply hoses come attached to the instrument and are color coded - blue for nitrous oxide. The instrument nitrous oxide hose is fitted with a US Standard Nitrous Oxide Gas Connection, Female Union, Size 3/4 in - 16 UNF. The hose is 1.8 m (6 ft) long. Connection adapters are supplied to suit different locations as illustrated in **Figure 14**.

**Table 12.** Nitrous oxide supplies

Region	Description
North America	Regulator with integral thermostatted heater
Continental Europe	Heater, for connection between cylinder and regulator



**Figure 14.** Nitrous oxide supply connection adapters

## Acetylene supply

### Acetylene safety

Unskilled, improper, or careless use of acetylene can create explosion hazards and fire hazards, which can result in death, severe personal injury or burns. Refer also to your local regulations governing the use of acetylene.

Your Agilent Flame AA spectrometer is designed to operate at fuel supply pressures between 65 and 100 kPa (9.5-14.5 psig). Refer to the following specifications or the rear of the instrument for the exact range and recommended pressure.

Do not use any tubing or connector that reacts chemically with acetylene.

**WARNING****Fire and Explosion Hazard**

Fire and/or explosion hazard, which could result in death or serious injury to personnel and damage to property. Never use copper tubing or tubing of alloys with more than 65% copper content. With these materials, copper acetylide could be formed and there is the risk of spontaneous fire or explosion. Explosive acetylides can form if acetylene contacts unalloyed copper, silver or mercury.

Acetylene is unstable as a free gas under pressure and it should not be piped at pressures exceeding 105 kPa (15 psi). At pressures above this level, acetylene can spontaneously explode.

Always use stainless steel, or black iron pipe for fixed supply lines, and test for leaks at regular intervals. The installation of acetylene gas must comply with the rules and regulations of the relevant local, state and federal authorities.

**Acetylene supply**

Use only acetylene that is packed in acetone. Some gas suppliers offer acetylene packed in material other than acetone. While these alternatives may overcome some of the disadvantages of acetone, they may also introduce the more serious problem of corrosion in the gas control module and must not be used with Agilent atomic absorption spectrometers.

Use 'Instrument Grade' acetylene that is at least 99.5% pure. Instrument-grade acetylene is free of phosphorus, arsenic and sulfur contaminants, which are residues of the acetylene generation process (calcium carbide and water). Phosphine content is also minimized. Phosphine contamination will depress calcium, strontium and barium absorption signals. Broadband emission from phosphine combustion products can interfere with sodium and potassium analysis.

**Table 13.** Acetylene supply specifications

Parameter	Specification
Quality	Instrument-grade, 99.0% pure (minimum)
Permissible pressure range	65 to 100 kPa (9.5 to 14.5 psi)
Recommended pressure	75 kPa (11 psi)
Normal flow rate	0 to 10 L/min
Packaging solvent	Acetone

Instrument supply hoses come attached to the instrument and are color coded - red for acetylene. The instrument acetylene hose is fitted with a US Standard Acetylene Gas Connection, Female Union, Size 9/16 in - 18 UNF, left thread. The

## Gas Supplies

hose is 1.8 m (6 ft) long. Connection adapters are supplied to suit different locations as illustrated in Figure 15.

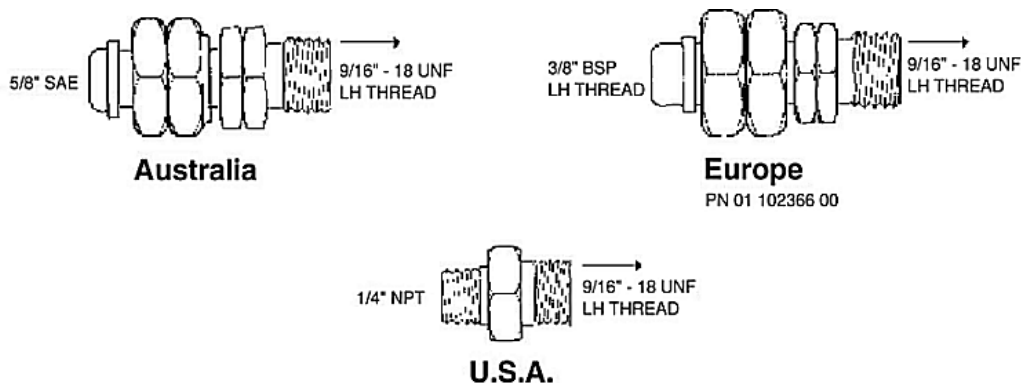


Figure 15. Acetylene supply connection adapters

The acetylene supply must be regulated to maintain the instrument operating pressure over the full range of normal flow rates. A dual stage regulator should be used. This is most important for instruments with programmable flow rates because a slow response from the regulator may cause the instrument to shut down during a demand for increased flow. A shutdown of this kind is safe and does not imply a fault in the instrument, but will interrupt your work.

Acetone, the acetylene packaging solvent, can damage neoprene, rubber and plastic components of the instrument. It can also absorb ultraviolet light and may affect analytical performance. High levels of acetone will reduce the flame temperature, which may affect analytical results at many wavelengths. Acetone may be entrained in the acetylene gas at low cylinder pressure.

### CAUTION

**You must replace the cylinder when its pressure falls to 700 kPa (100 psi) to prevent acetone from being entrained in the acetylene gas and causing damage to the instrument. Acetone may also be entrained if the flow rate exceeds 1/7th of the cylinder contents per hour. Your supplier can advise you on an appropriately rated cylinder.**

## Gas supplies for Graphite Tube Atomizers (Zeeman and non-Zeeman)

The graphite tube atomizer gas supply system is designed for use with inert gases and air. Argon, nitrogen and air are the *only* gases recommended for use with an Agilent GTA.

*Never* use pure hydrogen with the graphite tube atomizer, since this could result in leakage and potentially explosive accumulation of hydrogen. You may, however, use a proprietary, pre-packaged mixture of 95% argon (or nitrogen) and 5% hydrogen. *Never* attempt to create your own mixture of hydrogen and an inert gas for use with the GTA system.

If your applications require other gases, contact your Agilent sales and service office.

**Table 14.** GTA gas supply specifications

Parameter	Specification
<i>Normal</i> gas inlet quality	High purity argon, 99.99% pure (minimum) High purity nitrogen, 99.99% pure (minimum)
<i>Alternate</i> gas inlet quality	High purity nitrogen, 99.99% pure (minimum) Air, clean, dry and free of oil
Recommended pressure range	140 to 200 kPa (20 to 30 psi)
Maximum pressure	350 kPa (50 psi)
Normal flow rate (GTA 120)	0 to 0.3 L/min for internal flow, plus separate external flow of 0.5 L/min. Additional Boost flow of 3.0 L/min during atomization when programmed temperature exceeds 400 °C.

The GTA control unit is fitted with standard barbed-tail adapters for connection of gas supplies using reinforced plastic tubing (supplied) of 6 mm (1/4 in) internal diameter.

GTA gas supplies must be regulated to maintain the accessory operating pressures over the full range of normal flow rates under dynamic conditions. Dual-stage regulators should be used.

# Gas supplies for the Vapor Generation Accessory

Argon and nitrogen are the only gases recommended for use with the Agilent VGA. If your applications require other gases, contact your Agilent sales and service office.

**Table 15.** VGA gas supply specifications

Parameter	Specification
Quality	High purity argon, 99.99% pure (minimum) or High purity nitrogen, 99.99% pure (minimum)
Permissible pressure range	300 to 400 kPa (43 to 57 psi)
Recommended pressure	300 kPa (43 psi)
Normal flow rate	0.05 to 0.1 L/min

The VGA is fitted with 6-mm (1/4-in) internal diameter reinforced plastic hose for connection to a standard 6-mm (1/4-in) barbed-tail connector.

VGA gas supplies must be regulated to maintain the accessory operating pressure at its normal flow rate.

The VGA gas outlet should be fitted with a shutoff valve to prevent the loss of approximately 50 mm per minute of inert gas, which continues to flow when the VGA power is turned off.



After the gas requirements have been met, check the checklist box: *All gas supplies (at specified purities), regulators, and gas lines are installed.*



## 7 Instrument Shipping Information

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### NOTE

Do not open any of the AA or accessory boxes unless otherwise specified by an Agilent field service engineer.

---

### Insurance after delivery

As the carrier's liability ceases when the equipment is delivered, Agilent recommends that you arrange separate insurance that will cover transportation from the delivery point to the installation site. The delivery point will vary according to the carrier, the shipping method, and in some cases the terms of sale. Some carriers will only deliver to their own distribution center, while others may deliver to your off-loading bay. Few will deliver to the actual installation site.

### Transit damage

Transit damage can be obvious or concealed, and in either case will only be admitted by the carrier if it is reported as agreed in the terms of the carrier's agreement. For any claims against damage in transit, the following general rules apply:

- 1 Before accepting delivery, you should inspect the packages for signs of obvious damage. The nature of any obvious damage must be noted on the carrier's way-bill, and then must be countersigned by a representative of the carrier.
- 2 Within the time limits stated in the terms of conditions of carriage, a further inspection must be made for concealed damage. If any damage is found at

## Instrument Shipping Information

this stage, the carrier must be notified in writing and all packaging material must be retained for subsequent inspection by a representative of the carrier.

- 3 A copy of any damage report must be forwarded to the Agilent sales office dealing with the supply of the equipment.

Agilent instruments are inherently robust, and the packaging is designed to prevent internal damage when shipped or handled in accordance with the labels and warnings. However, it must be remembered that the contents form part of a precision measuring system, and all packages should be handled accordingly. In transit, sharp jolts and shocks must be avoided, and the packages must not be unnecessarily inverted or tilted. Markings on the shipping cartons generally indicate which side of the package should be kept at the top.

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### WARNING



#### Heavy Weight

**Many of the packages are large and heavy. To avoid injury to personnel, or accidental damage to the equipment, always use two or more people when lifting equipment into position. Never attempt to lift packages alone.**

### WARNING



#### Shock Hazard

**To prevent death or personnel injury from accidental contact with high voltages within the instrument, do not remove any of the instrument covers. Do not connect the instrument to the mains supply.**

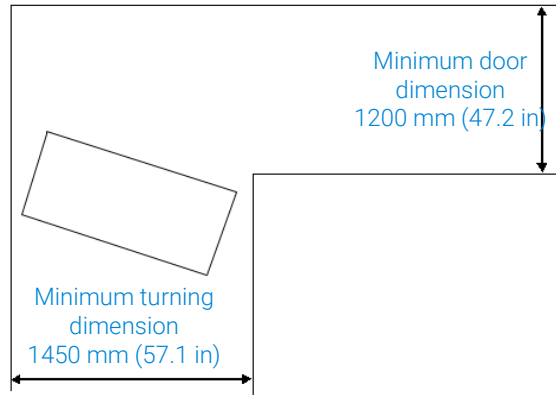
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## In-house transit routes

In-house transit routes must be carefully considered. Vertical, horizontal and turning clearances should be calculated from the shipping crate dimensions of the spectrometer, which is the largest unit in any system arrangement.

Figure 16 provides an indication of the minimum turning clearance and minimum door width required for the spectrometer in its shipping crate.

Particular attention should be made to the clearance of any doors in the transit route to the laboratory. The required turning and door clearance may need to take into consideration any lifting device used for transporting the instrument (for example, fork lift, pallet truck or trolley).



**Figure 16.** Minimum clearance required for transportation in the shipping crate (Agilent 55B/240/280 AA)

Carefully check the clearance of any doors in the transit route to the laboratory. The required turning and door clearance may need to take into consideration any lifting device used for transporting the instrument (for example, fork lift, pallet truck or trolley).

- After the in-house transit route requirements have been met, check the checklist box: *Entrance to the lab is at least 1450 cm (57.1 in) wide.*
- After the boxes have been checked for transit damage, check the checklist box: *Instrument boxes have arrived undamaged or a copy of any damage report has been forwarded to the Agilent sales office.*

## Instrument Shipping Information

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## 8

# Computer and Software Installation Information

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## Recommended computer configuration

If you are supplying your own personal computer (PC) for use with an Agilent AA instrument, the recommended configuration is shown below.

- 1 GHz 64-bit (x86) dual core processor or higher
- 8 GB RAM
- 500 GB Hard disk drive
- 256 MB Graphics card supporting 1024 x 768 resolution
- DVD-ROM drive
- Integrated audio/sound card and speakers
- Keyboard and Mouse
- 19 in LCD Monitor
- Microsoft Windows 10 Professional 64-bit operating systems

### NOTE

The PC must use the USB-GPIB converter.

If SPS 3 Autosampler or ETC 60 accessories are being used an RS232 port is required for each of these.

A USB port is required if the camera option or an SPS 4 Autosampler is to be used.

Locate the PC keyboard and mouse for ergonomically correct access.

## Installing the Microsoft Windows operating system

If you are using a PC not purchased from Agilent Technologies, refer to the documentation supplied with Microsoft Windows for instructions on installing the Windows operating system. It is the responsibility of the customer to ensure that the Microsoft Windows operating system is installed on the computer.

The following information assumes that you are working on a clean, empty hard disk. If you have any other files on the PC hard disk, ensure you make backups of these before continuing.

**NOTE**

Agilent will not assume responsibility for loss of data.

---

For instructions on installing the Microsoft Windows operating system, refer to the Microsoft Windows manuals supplied with the software. If the customer is supplying the PC, it is their responsibility to ensure Windows 10 Professional 64-bit is installed.

- SpectrAA Base (for use with SpectrAA Base version 5.5 or greater)
- SpectrAA PRO (for use with SpectrAA PRO version 5.5 or greater)
- SpectrAA CFR (for use with SpectrAA CFR version 5.5 or greater)

**NOTE**

To ensure correct operation, the user installing the operating system must have Administrator privileges for correct installation of Agilent AA software.

---



After the PC requirements have been met, enter the requested information and then check the checklist box: *PC components on site*.

## Installing Agilent SpectrAA software

During the instrument installation, your Agilent field representative will install the SpectrAA or SpectrAA and CFR software.

For instructions on installing Agilent AA software, refer to the software installation instructions that came with your software.

## Installing Agilent SpectrAA CFR software

Agilent SpectrAA CFR software should be installed by the System Administrator and the System Administrator must be onsite during installation of the Agilent AA instrument.

---

**NOTE**

Agilent SpectrAA CFR software requires both SpectrAA Base and Pro software to be installed prior to installation.

Refer to the '21 CFR Part 11 Electronic Records, Electronic Signatures Compliance' manual, the SDA Help and the SCM Help supplied with the SpectrAA CFR software for details on how to configure the Microsoft Windows operating system and for details on setting up users and assigning user privileges.

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**NOTE**

All information in this manual is accurate at the time of publication. For the most current information, contact your local Agilent representative.

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## Computer and Software Installation Information

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## 9 Operator Training

Operator confidence when using atomic absorption instrumentation is essential to obtain accurate and reliable results. The Agilent field service engineer who installs your equipment will demonstrate the basic operating procedures while conducting the installation performance tests. The engineer is not necessarily experienced in more complex analytical procedures and is *not* authorized to conduct extended training. The service representative will explain elementary operations but is *not* authorized to conduct extended training on the Microsoft Windows operating system.

Your operators will gain most from observing the installation and will be more immediately productive if they have already been trained. Agilent recommends that you take advantage of special training courses that are conducted at various locations by the Agilent technical support organization.

In some locations, it may be possible to arrange for operator training after the installation, using your own instrument. Contact your Agilent sales and service office if you would like to arrange this.

## In This Guide

The guide describes the following:

- Safety Practices and Hazards
- Introduction
- Laboratory Environment
- Laboratory Facilities
- Instrument Shipping Information
- Software Installation Guidelines
- Operator Training

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