

## Agilent AA Spectrometer Systems Site Preparation Checklist

Thank you for purchasing an Agilent **AA Spectrometer System**. To get you started and to assure a successful and timely installation, please refer to this specification or set of requirements.

Correct site preparation is the key first step in ensuring that your instruments and software systems operate reliably over an extended lifetime. This document is an **information guide AND checklist** prepared for you that outlines the supplies, consumables, space and utility requirements for your equipment for your site.

### Customer Responsibilities

**Make sure your site meets the following prior specifications before the installation date. For details, see specific sections within this checklist, including:**

- The necessary laboratory or bench space is available
- The environmental conditions for the lab as well as laboratory gases and plumbing
- The power requirements related to the product (e.g., number & location of electrical outlets)
- The required operating supplies necessary for the product and installation
- Please consult Other Requirements section below for other product-specific information.
- Please follow the site preparation instructions provided in Site Preparation Guide, part number 8510119300. This document is only an overview of the main requirements.
- Agilent Technologies service providers will not install your Agilent AA spectrometer system until an adequate exhaust system is present and functioning. See Environmental Conditions section.

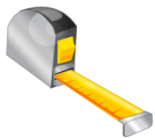
**If Agilent is delivering installation and familiarization services, users of the instrument should be present throughout these services; otherwise, they will miss important operational, maintenance and safety information.**

- This checklist 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.

### Important Customer Information

1. If you have questions or problems in providing anything described as a Customer Responsibilities above, 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.
2. Should your site not be ready for whatever reasons, please contact Agilent as soon as possible to re-arrange any services that have been purchased.
3. 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.

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### Dimensions and Weight

Identify the laboratory bench space before your system arrives based on table 1 below.

Pay special attention to the **total height and total weight requirements for all system components you have ordered and avoid bench space with overhanging shelves**. Also pay special attention to the total weight of the modules you have ordered to ensure your laboratory bench can support this weight.

#### Special Notes

1. The Agilent AA Spectrometer System, its data system and accessories will be delivered to your site in large and small shipping containers. Note the size of the largest shipping container below.
2. The containers will be delivered in a large truck. You must furnish a forklift, or other suitable lifting device, and make arrangements to unload the truck and transport the containers to your site. All doorways, hallways, floors and elevators must be able to accommodate the largest, heaviest container. Do not open any of the shipping containers unless a representative of Agilent Technologies is present.
3. The workbench must be free from vibration, and be stable and strong enough to support the total weight of the equipment to be used.
4. 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 100mm clearance between instrument panels and walls.

**Table 1. Equipment weights and dimensions for Agilent AA systems**

System unit	Width	Depth	Height	Weight
55B AA spectrometer	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)
240 AA spectrometer	790 mm (31 in)	580 mm (23 in)	590 mm (23 in)	56 kg (123 lb)
240Z AA spectrometer. Also requires GTA 120Z (see below)	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)
280FS AA spectrometer	790 mm (31 in)	580 mm (23 in)	590 mm (29 in)	75 kg (165 lb)
280Z AA spectrometer. Also requires GTA 120Z (see below)	790 mm (31 in)	580 mm (23 in)	740 mm (29 in)	61 kg (135 lb)

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System unit	Width	Depth	Height	Weight
280FS/Z AA shipping dimensions	1210 mm (48 in)	820 mm (32 in)	1020 mm (40 in)	106 kg (234 lb)
GTA 120 Graphite Tube Atomizer (workhead stowed)	240 mm (10 in)	600 mm (24 in)	580 mm (23 in)	41 kg (90 lb)
GTA 120 shipping dimensions (including PSD 120)	960 mm (38 in)	770 mm (30 in)	850 mm (34 in)	76 kg (167 lb)
GTA 120Z (including workhead)	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)
PSD 120 Programmable Sample Dispenser	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)
SPS 3 Sample Preparation System	490 mm (19 in)	300 mm (19 in)	515 mm (20 in)	15 kg (33 lb)
SPS 3 shipping dimensions	760 mm (29.9 in)	500 mm (19.7 in)	840 mm (33 in)	31 kg (68.3 lb)
SPS 3 with diluter	572 mm (23 in)	300 mm (11 in)	515 mm (20 in)	18 kg (39.6 in)
SPS 3 with diluter shipping dimensions	760 mm (23.6 in)	500 mm (15.7 in)	840 mm (33 in)	34 kg (74.9 lb)
SPS 3 trolley dimensions	600 mm (23.6 in)	420 mm (16.5 in)	775 mm (30.5 in)	
VGA 77 Vapor Generation Accessory	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)
UltrAA Boosted Lamp Supply	240 mm (9 in)	145 mm (6 in)	355 mm (14 in)	7.5 kg (17 lb)
SIPS 10/20 Sample Introduction Pump System power module	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)

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## Environmental Conditions

Operating your instrument within the recommended temperature ranges insures optimum instrument performance and lifetime.

### 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.

### Temperature, Humidity, and Altitude

	Altitude	Temperature Range	Relative Humidity (non-condensing)
<b>For operation</b>	0 to 853 m (0 to 2800 ft)	10 to 35 °C (50 to 95 °F)	8 to 80%
	853+ to 2133 m (2801 to 7000 ft)	10 to 25 °C (50 to 77 °F)	8 to 80%
<b>For storage</b>	0 to 2133 m (0 to 7000 ft)	5 to 45 °C (40 to 115 °F)	20 to 80%

**Table 2. Agilent AA Spectrometer Environmental Conditions**

### Special Notes

1. For optimum performance; it is recommended that the temperature of the laboratory be between 20 and 25 °C (68 and 77 °F) and held constant to within  $\pm 2$  °C ( $\pm 3.6$  °F) throughout the entire working day.
2. User safety requires that the exhaust gases from the AA instrument be vented externally to the building and not re-circulated by the environmental control system. Health hazards include chemical toxicity of solvents and samples.

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### Exhaust Systems

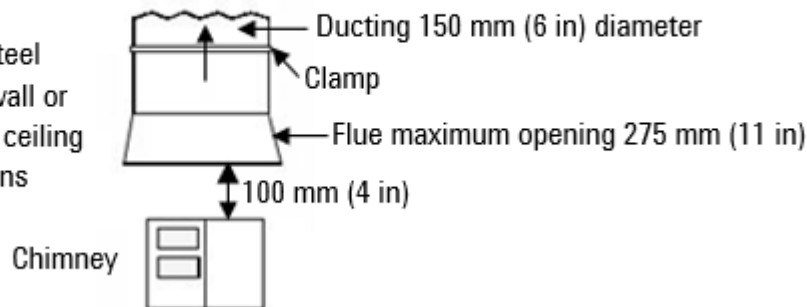
The spectrometer must be located under a flue, which is vented by an exhaust fan and ducted to an external vent. The exhaust system with flue, ducting and external vent must provide a minimum flow of 6 cubic meters per minute (200 cfm) at 16-mm water gauge static pressure (free delivery of 11 cubic meters per minute; or 388 cfm).

For AA flame instruments 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.

Exhaust fumes can be toxic or corrosive.

Locate the fan at least 3 m  
(10 ft) away from the flame

Secure the flue by steel  
brackets fixed to a wall or  
suspended from the ceiling  
by steel rods or chains



### Special Notes

1. The exhaust system 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.
2. 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.
3. 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.
4. The external vent must be fitted with a backdraft damper, and the outlet location must be clear of doors, windows and air-conditioning inlets.
5. The customer is responsible for installation of the extraction system prior to the installation of the AA spectrometer system by Agilent.

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## Power Consumption

All power supplies should be single phase AC, 3-wire system (active, neutral and ground, or two actives and ground) and should be 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.

A separate connection receptacle should be provided for each unit in the system (see Tables 3 and 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.

### Special Notes

1. 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
2. \* 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.
3. 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).
4. NOTE for Zeeman AA instruments and GTA units the VA and current figures shown in table 3 are the typical continuous VA and current drawn. 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).
5. 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.

**Table 3. Electrical specifications for Agilent AA systems**

Instrument Description	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*

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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

**Table 4. Agilent AA spectrometer power connections**

<b>Plug supplied</b>	<b>Standard</b>	<b>GTA120 or Zeeman</b>
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 SheetVII or NFC 61.303	Kaiser CEBEC 616 VDE. Complies with DIN 49441R2
<b>Required wall socket type</b>	<b>Standard</b>	<b>GTA120 or Zeeman</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)

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## Cooling Water Requirements

Agilent AA flame operation does not require cooling water. For furnace operation the Graphite Tube Atomizer (GTA 120) must have a supply of cooling water to remove heat from the furnace workhead. 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. 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.

If you decide a heat exchanger may be necessary, any such installation must be capable of extracting 950 W at 20 °C de-rated by 17% for 50 Hz operation.

**Table 5. Agilent GTA 120 water cooling system specifications**

Cooling Water 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)

### Special Notes

1. 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.
2. The preferred cooling system is the Agilent Chiller (G8481A), filled with Poly-Clear Fluid (G3292-80010).



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### Gas Requirements

Only three gases are specified for flame operation in Agilent AA spectrometers. They are AIR, NITROUS OXIDE and ACETYLENE. Agilent will not install a flame instrument where other gases are provided for connection to it.

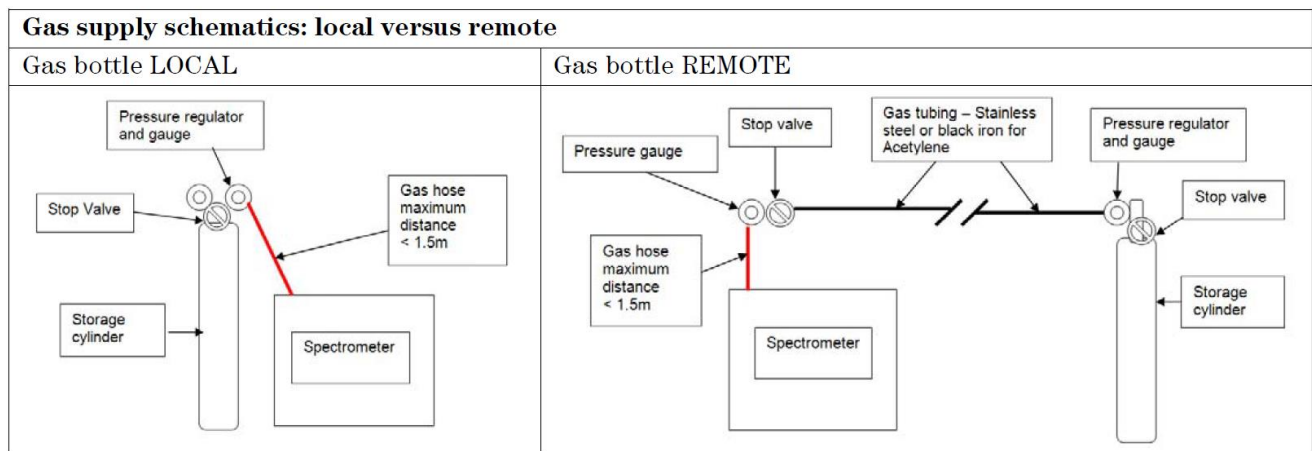
For furnace operation and some accessories inert gases such as Argon or Nitrogen are typically used. Refer to sections below for specific instrument and accessory requirements.

Gases may be supplied by from a source (typically cylinder/bottle) mounted in close proximity to the instrument or accessory (LOCAL) or via a reticulation system (tubing/pipes) external to the location of the instrument/accessory (REMOTE). For either supply type (Local or remote) all gas supplies should be fitted with a suitable gas regulator and shutoff valve for the supply. These should be located within easy access for the user of the instrument or accessory to check the regulation being supplied and to isolate the gas supply quickly if required.

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

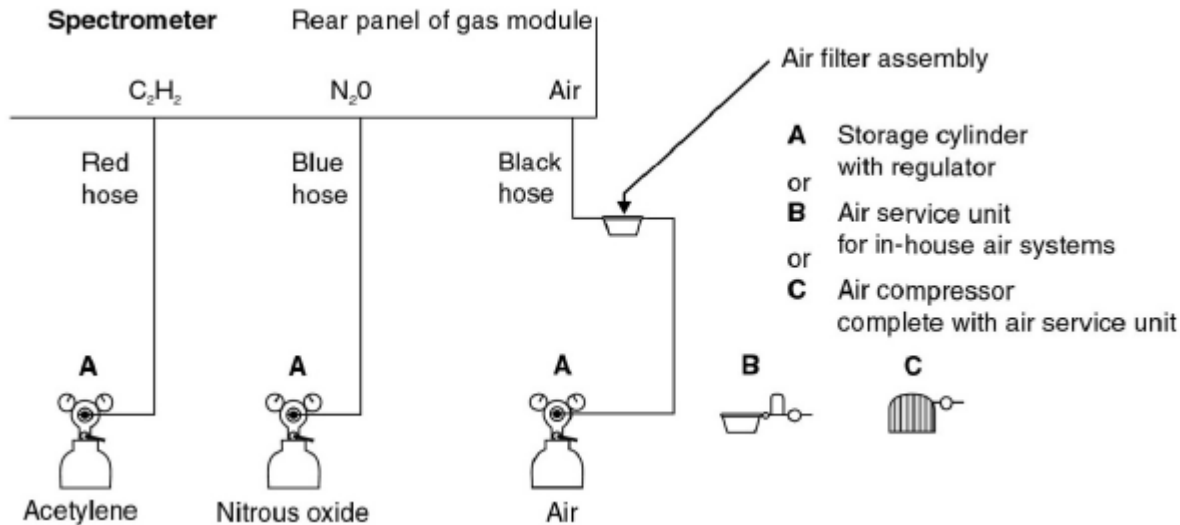
#### Special Notes




- 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.
- In planning your gas reticulation scheme, observe the following points:
  - Never use 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.)
  - Use only correctly matched fittings – DO NOT use PTFE tape to fit non-matching fittings together.
  - To minimize pressure drop it is recommended to use only 3/8-inch tube or 1/2-inch pipe.
  - Fit pressure gauges on a wall at the supply point, and ensure that they are visible to the operator.



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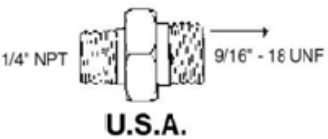
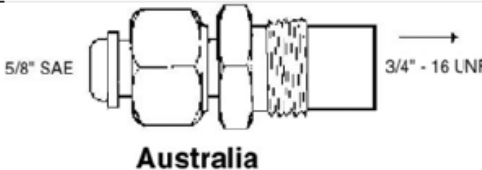
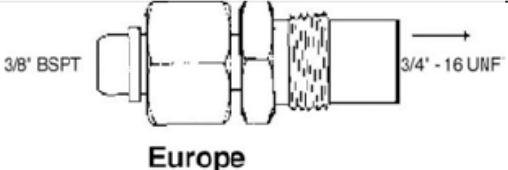
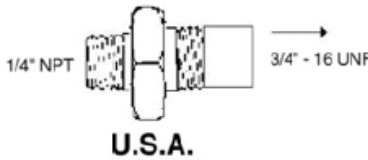
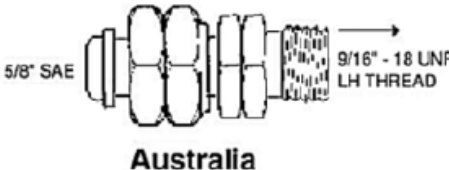
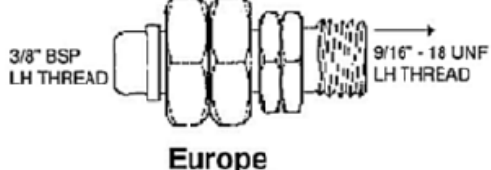

3. For flame instrument if you choose an air supply derived from a general purpose in-house system or from a dedicated air compressor, a filter unit must be installed. If your location has high humidity, the air supply should include a dryer or condenser device.

**Gas requirements for Agilent flame instruments**




Gas requirements table for AGILENT flame spectrometers		
	<b>AIR</b> - US Standard Compressed Air connection, Female Union, Size 9/16 in - 18 UNF	
	Quality	Clean, dry, free of oil - see note 6 below
	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
	<b>NITROUS OXIDE (N<sub>2</sub>O)</b> - US Standard Nitrous Oxide Gas Connection, Female Union, Size 3/4 in - 16 UNF	
	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
	<b>ACETYLENE (C<sub>2</sub>H<sub>2</sub>)</b> - US Standard Acetylene Gas Connection, Female Union, Size 9/16 in - 18 UNF, left thread	
	Quality	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

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Instrument supply hoses come attached to the instrument and are color coded - Black for AIR, Blue for NITROUS OXIDE and Red for ACETYLENE. Each of the hoses are 1.8 m (6 ft) long. Connection adapters are supplied to suit different locations, as illustrated in Figure below.

	AGILENT supplied gas adaptor fittings	
<b>AIR</b>	 <p><b>Australia</b></p>	 <p><b>Europe</b></p>
	 <p><b>U.S.A.</b></p>	
<b>NITROUS OXIDE</b>	 <p><b>Australia</b></p>	 <p><b>Europe</b></p>
	 <p><b>U.S.A.</b></p>	
<b>ACETYLENE</b>	 <p><b>Australia</b></p>	 <p><b>Europe</b> PN 01 102366 00</p>
	 <p><b>U.S.A.</b></p>	

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**Gas requirements for Agilent accessories**

Agilent AA Accessory	Compressed Gas Requirement
 <p style="text-align: center;">GTA 120</p>	<p>Argon, nitrogen and air are the only gases recommended for use with an Agilent GTA 120. Proprietary mixtures of argon or nitrogen containing up to 5% hydrogen may be used. If your applications require other gases, contact your Agilent sales and service office.</p> <p>Normal gas inlet → High purity argon, 99.99% pure (minimum) Or → High purity nitrogen, 99.99% pure (minimum)</p> <p>Alternate gas inlet → High purity argon, 99.99% pure (minimum) * Or → High purity nitrogen, 99.99% pure (minimum)* * Must be Air, clean, dry and free of oil</p> <p>Recommended pressure range 140 to 200 kPa (20 to 30 psi) Maximum pressure 350 kPa (50 psi)</p> <p>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.</p> <p>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.</p>
 <p style="text-align: center;">VGA-77</p>	<p>Argon and nitrogen are the only gases recommended for use with the Agilent VGA-77</p> <p>Quality High purity argon, 99.99% pure (min) or High purity nitrogen, 99.99% pure (min)</p> <p>Permissible pressure range 300 to 400 kPa (43 to 57 psi)</p> <p>Recommended pressure 300 kPa (43 psi)</p> <p>Normal flow rate 0.05 to 0.1 L/min</p> <p>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. VGA gas supplies must be regulated to maintain the accessory operating pressure at its normal flow rate.</p> <p>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.</p>

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 <p>SPS 3</p>	<p>No gas requirements</p>
 <p>SPS 4</p>	<p>No gas requirements</p>
 <p>SIPS-10 and SIPS-20</p>	<p>No gas requirements</p>
 <p>UltrAA Lamp Controller</p>	<p>No gas requirements</p>
 <p>ETC-60</p>	<p>No gas requirements</p>

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### Waste Fluids

During flame operation your Agilent AA 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.

Agilent AA instruments also need 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 you for this purpose.

### Important Customer Web Links

- For additional information about our solutions, please visit our web site at <http://www.chem.agilent.com/en-US/Pages/HomePage.aspx>
- Need to get information on your product?  
Literature Library - <http://www.agilent.com/chem/library>
- Need to know more?  
Customer Education - <http://www.agilent.com/chem/education>
- Need technical support, FAQs? - <http://www.agilent.com/chem/techsupp>
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**Do not include this section in the PDF version.**

Print only the checklist for the PDF. Do not include this page. This page is NOT intended for customer viewing. See the guidance instructions at the end of the template for more information.

## Document Control Logs

### Revision Log

Revision	Date	Reason For Update
0.1	3 March 2016	Document creation.

### Approval Log

Revision	Approver	Title of Approver