Agilent

Agilent 700 Series ICP Optical Emission Spectrometers

Site Preparation Guide



Notices

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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 General Information

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Heat, Vapors and Fumes

Heat, ozone, vapors and fumes generated by the plasma can be hazardous, and must be extracted from the instrument by means of an exhaust system. Ensure that an exhaust system of the appropriate type is fitted (see Page 16). The system must be vented to the outside air in accordance with local regulations and never within the building. Regularly check the exhaust system by smoke test to ensure that the exhaust system is functioning correctly. The exhaust fan must always be switched on *before* igniting the plasma.

Compressed Gas Hazards

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 result in an oxygen-deficient atmosphere, which can cause asphyxiation. The area in which cylinders are stored and the area surrounding the instrument must be adequately ventilated to prevent such gas accumulations.

Gas cylinders must be installed, stored and handled strictly in accordance with local safety codes and regulations. Cylinders must be used and stored only in a vertical position and secured to an immovable structure or a properly constructed cylinder stand. Move cylinders only by securing them to a properly constructed trolley.

Use only approved regulator and hose connectors (refer to the gas supplier's instructions).

If using cryogenic gases (for example, liquid argon), prevent severe burns by wearing suitable protective clothing and gloves.

Electrical Hazards

Connecting the Agilent ICP-OES to a power source that is not equipped with a protective earth contact creates a shock hazard for the operator and can damage the instrument. Likewise, interrupting the protective conductor inside or outside the Agilent ICP-OES or defeating the power cord ground creates a shock hazard for the operator and can damage the instrument.

Other Precautions

Air flow to the cooling fans of the spectrometer and accessories must be unobstructed. Do not block the ventilation grills on the spectrometer and accessories. The required ventilation space is specified on Page 9. Consult the manuals supplied with your PC, monitor, printer and water-cooling system for their specific ventilation requirements.

The spectrometer weighs approximately 203 kg (448 lb). To avoid injury to personnel or damage to the instrument or property, always use a forklift or other suitable mechanical lifting device to move the instrument.

2 Laboratory Environment

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Environmental Conditions

The Agilent ICP-OES instrument is suitable 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 non-conductive pollution occurs.

Table 1 Suitable environmental conditions for the Agilent 700 Series ICP-OES instruments

Condition	Altitude	Temp. (°C)	Humidity (%RH) non-condensing
Non-operating (Transport)	0–3,050 m (0-10,000 ft)	5–45	20–80
Operating within specifications	0–3,050 m (0-10,000 ft)	20–25	8–80

Temperature Control

Air-conditioning is strongly recommended for control of the environment.

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 ±2 °C (±3.6 °F) throughout the entire working day.

Most of the 3,650 watts (joules per second) or 13,140 kilojoules per hour (12,455 BTU per hour) generated by the system is vented outside the laboratory by the exhaust system.

The water chiller generates approximately 1,000 watts (joules per second), or 3,600 kilojoules per hour (3,412 BTU per hour).

Total load with both the water chiller and Agilent 700 Series ICP-OES in the same room can be up to 4,650 watts or 16,740 kilojoules per hour (15,867 BTU per hour).

Cleanliness

The area selected for the operation of an Agilent 700 Series ICP-OES system *must be free from drafts, corrosive atmospheres and vibration* and should be a dust-free, low humidity environment**.**

Sample preparation areas and materials storage facilities should be located in a separate room.

Limit dust levels to less than 36,000,000 particles (0.5 microns or larger) per cubic meter of air. This is equivalent to a very clean office.

Instrument Cooling Air Supply

The Agilent 700 Series ICP-OES instrument requires *clean, dry, non-corrosive air for cooling purposes.* This is supplied to the instrument through an air supply vent located at the top, rear of the instrument. The vent is fitted with a dust filter, to filter out particulate matter from the surrounding environment.

The air supply is used to cool the RF generator and the electronics of the instrument. Several of these assemblies contain parts prone to corrosion. The introduction of cooling air contaminated with high levels of acid vapor or other corrosive substances may cause damage to the instrument.

Due to the corrosive nature of some analytical work, it is recommended that in applications demanding high usage of corrosive materials, an external cooling air supply system be provided. It is *strongly recommended* that the cooling air be supplied from an environmentally controlled area that is away from the instrument exhaust and any other area where corrosive materials are stored or used.

The cooling air system with flue, fan, ducting and supply cowl, must provide a minimum positive flow of 6 cubic meters per minute (200 ft^3/min). The ducting should be corrosion resistant and fire-proof.

NOTE

If an external cooling air supply system is required, an air inlet duct attachment must be ordered with the instrument.

Workbench

The Agilent 700 Series ICP-OES is a precision optical instrument. The workbench must be free from vibration and must be stable and strong enough to support the total weight of the equipment to be placed on top of the workbench. The bench top should be large enough to permit free circulation of air through the main instrument and around each of the accessories.

The information provided in the weights and dimensions table will help make planning easier. Portable or semi-permanent trolleys can be used as workbenches for the spectrometer system, but you must *lock* the wheels. Accessories such as the Sample Preparation System (SPS) Autosampler, PC and printer can be positioned on a trolley. A specially designed SPS trolley is available from Agilent.

To avoid damage through spillage of samples being used, the instrument bench top should be covered with a material that is corrosion-resistant and impervious to liquid spillage. Generally, for comfortable working conditions and easy access to the instrument sample introduction system, Agilent recommends that the height of the workbench be approximately 900 mm (36 in) high. Refer to Figure 1.

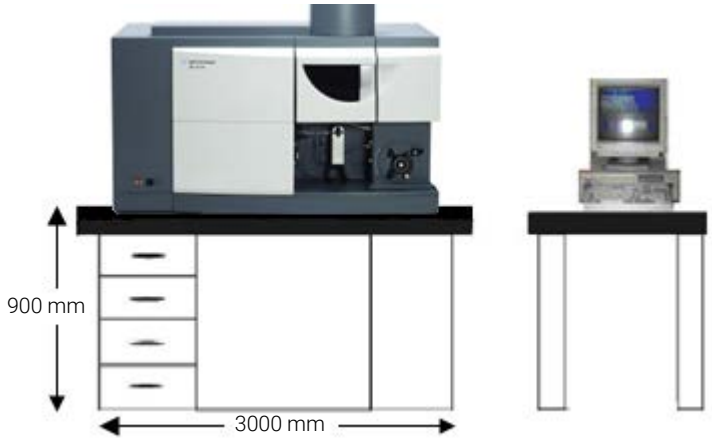


Figure 1. Instrument workbench

Location

The workbench location should permit service access from all sides. Position the equipment for easy access to the disconnecting switch on the rear of the instrument. A minimum of 400 mm (16 in) free space at the sides of the spectrometer and approximately 750 mm (30 in) at the rear of the instrument is

required for maintenance and service access. Leave enough space in front of the instrument to provide easy access to the mains power on/off switch at all times.

The Agilent 700 Series ICP-OES system should not be located close to an access door, window or any other area where drafts may cause unstable temperature conditions.

The following diagrams show the relative dimensions of the main instrument including the space needed for service access. These dimensions should be considered during the preparation for installation of your spectrometer.

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 Section 4).

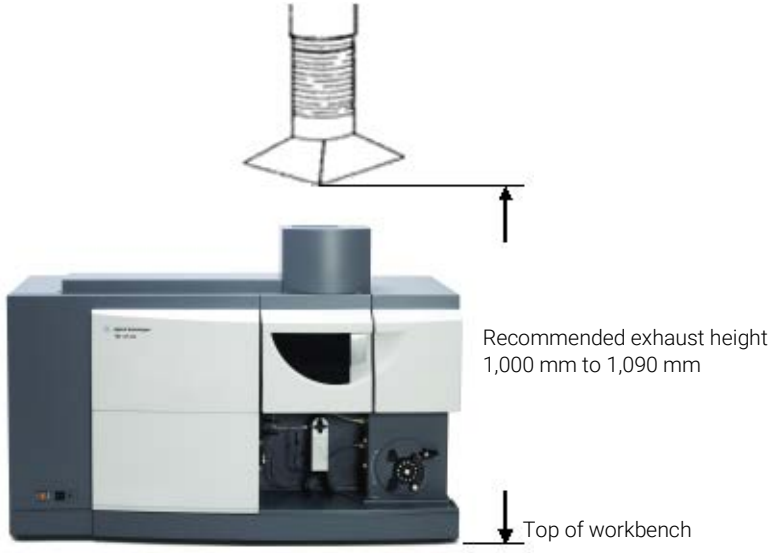


Figure 2. Front view of instrument

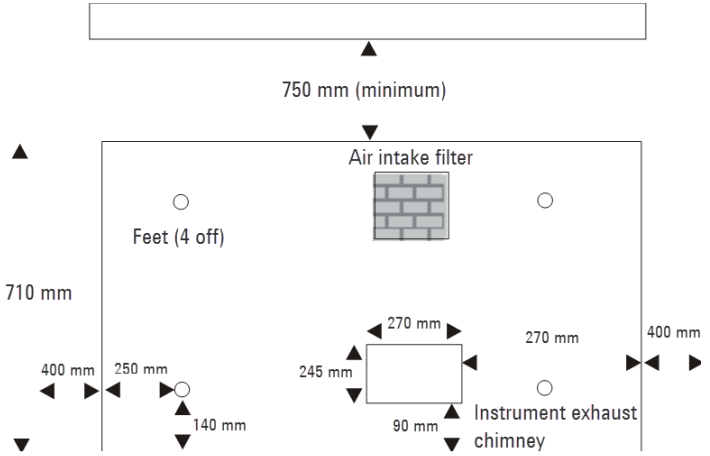


Figure 3. Top view of instrument

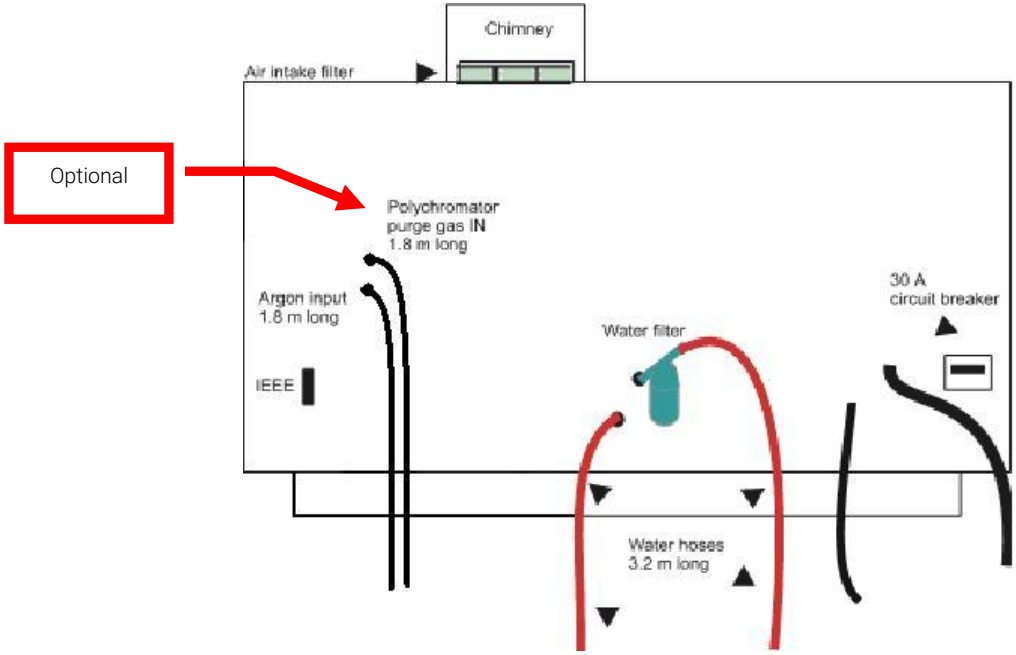


Figure 4. Rear view of instrument

PC Requirements

If you are supplying your own personal computer (PC) for use with an Agilent 700 Series instrument, the minimum recommended configuration is shown.

Recommended PC Configuration

- IBM compatible PC with Quad-core 2.66 GHz processor
- 2 GB RAM
- 500 GB hard disk drive
- 256 MB Graphics card supporting 1024 x 768 resolution
- 16 speed DVD drive
- Integrated audio/sound card and speakers
- Serial port
- Keyboard and Mouse
- 19 in LCD monitor
- Windows 10 Professional 64-bit system

NOTE

The PC must have one spare full height PCI expansion slot for the I/O card.

Higher rated PC components can be substituted for those listed above for example, processor type, amount of memory, screen size and resolution.

GPIB Communications

The Agilent 700 Series ICP-OES systems require a USB-GPIB-HS converter to be fitted in the PC. You may need to purchase a National Instruments USB-GPIB-HS converter. Contact your Agilent representative for more information.

Refer to the 700 Series ICP-OES User's Guide for GPIB communications device installation instructions.

3 Instrument Transit Information

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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 5 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).

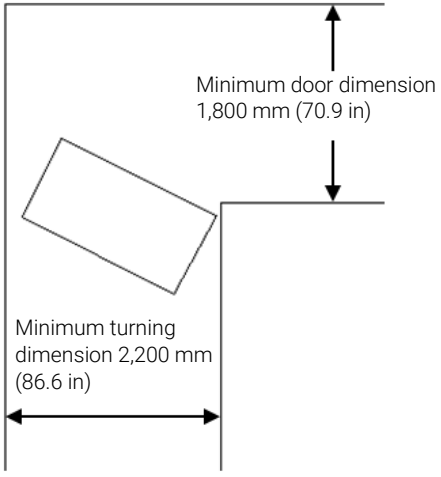


Figure 5. Maximum clearance required for transportation in the shipping crate

Weights and Dimensions

Table 2 Weights and dimensions

System unit	Width	Depth	Height	Weight
Agilent 700 Series ICP-OES instrument	1,375 mm, 54.5 in	750 mm, 29.5 in	990 mm, 39 in	203 kg, 448 lb
Shipping dimensions	1,660 mm, 65.5 in	960 mm, 37.8 in	1,420 mm, 56 in	285 kg, 629 lb
Personal computer (typical)	450 mm, 18 in	770 mm, 30 in	520 mm, 20 in	(N/A)
Printer (typical)	500 mm, 18 in	650 mm, 30 in	200 mm, 20 in	(N/A)
Water cooling system				
G8481A Agilent water chiller	368 mm, 14.5 in	702 mm, 27.6 in	575 mm, 22.6 in	82 kg, 181 lb
SPS 3	490 mm, 19.3 in	285 mm, 11.2 in	510 mm, 20.1 in	15 kg, 33.1 lb
Shipping dimensions	760 mm, 29.9 in	500 mm, 19.7 in	840 mm, 33.1 in	31 kg, 68.4 lb
SPS 3 with diluter	572 mm, 22.5 in	285 mm, 11.2 in	510 mm, 20.1 in	18 kg, 39.7 lb
Shipping dimensions	760 mm, 29.9 in	500 mm, 19.7 in	840 mm, 33.1 in	34 kg, 75.1 lb
SPS trolley	580 mm, 23 in	412 mm, 17 in	400 mm, 16 in	
SVS 1	54 mm, 2.1 in	110 mm, 4.3 in	177 mm, 7.0 in	615 g, 1.36 lb
Shipping dimensions	380 mm, 15 in	410 mm, 16.1 in	265 mm, 10.4 in	2 kg, 4.4 lb
SVS 2	54 mm, 2.1 in	110 mm, 4.3 in	177 mm, 7.0 in	620 g, 1.37 lb
Shipping dimensions	400 mm, 15.7 in	370 mm, (14.6 in.)	250 mm, (9.8 in.)	4.0 kg, (8.8 lb)
Fast Uptake Pump for SVS 2	122 mm, 4.8 in	170 mm, 6.7 in	97 mm, 3.8 in	0.96 kg, 2.1 lb
VGA (including mounting bracket)	385 mm, 10 in	340 mm, 8 in	195 mm, 9 in	6 kg, 13.2 lb
Shipping dimensions	490 mm, 19.5 in	490 mm, 19.5 in	320 mm, 12.5 in	10 kg, 22 lb
AGM 1 Shipping dimensions	550 mm, 22 in	430 mm, 17 in	245 mm, 9.5 in	
Ultrasonic nebulizer (trolley mounted)	780 mm, 31 in	540 mm, 21 in	1,150 mm, 45 in	

WARNING



Heavy Weight

The Agilent 700 Series ICP-OES weighs approximately 203 kg (448 lb). To avoid injury to personnel or damage to equipment, always use a fork lift or other suitable lifting device when moving the instrument.

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Exhaust System

The Agilent 700 Series ICP-OES must be located under a flue that is vented by an exhaust fan and ducted to an external vent.

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

- The exhaust system with flue, ducting and external vent must provide a minimum flow of 6 cubic meters per minute (200 ft^3/min).
- The exhaust fan should be located at least 2 meters (6 feet and 6 inches) away from the top of the instrument chimney.
- The fan control switch and running indicator lamp should be located in a position where the instrument operator can view the indicator and access the control switch.
- Ducting must be corrosion-resistant, fire-proof and should be kept clear of fire alarms, sprinkler heads and other heat sensitive devices.
- The external vent must be fitted with a back-draft damper and the outlet location must be clear of doors, windows and heater or air-conditioning units.

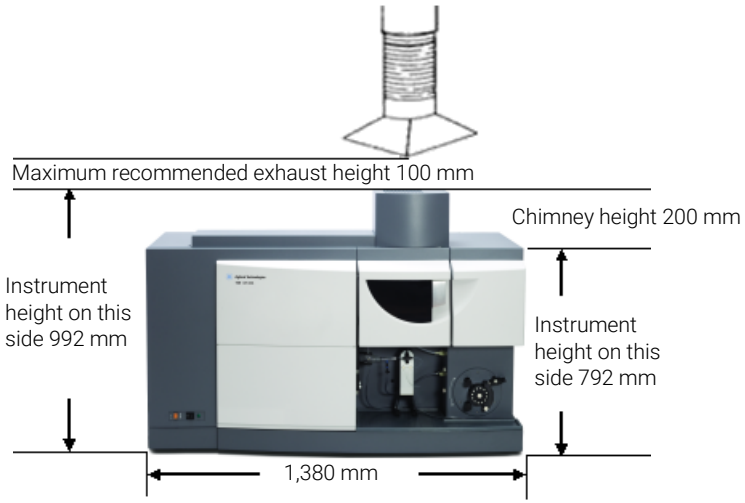


Figure 6. Spectrometer and flue position

Agilent Exhaust System

The component parts required for an exhaust system may be purchased from Agilent. The parts may be ordered individually or in kit form.

To allow for personal preferences, control gear, switch and pilot light assemblies are not supplied by Agilent.

Two kits are available:

- Exhaust kit for 240 V, 50 Hz supply
- Exhaust kit for 115 V, 60 Hz supply

NOTE

Mounting hardware for the flue and fan is not included with the Agilent-supplied Exhaust Kit.

The exhaust system must be installed by local fitters and not the Agilent service engineer.

Agilent Exhaust Fan Electrical Information

Table 3 Exhaust fan motor specifications

Voltage	240 volts single phase	115 volts single phase
Current	0.45 A	0.7 A
Frequency	50 Hz	60 Hz
Power input	74 W	51 W
Direction of rotation	Anti-clockwise (shaft end)	
Nominal RPM	≅ 1600	

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 power supplies for the Agilent 700 Series ICP-OES, its accessories and water chiller should be single phase, AC, 3 wire systems (active, neutral, ground; or two active and ground). Each connection should be terminated at an appropriate receptacle within reach of each assembly's power cable. Use of power boards or extension cables is *not* recommended**.** If the desired location of equipment does not permit the standard power cord to reach an electrical outlet, your electrician should install additional outlets. Otherwise, you should relocate the equipment closer to existing electrical outlets.

The outlet for the Agilent ICP-OES must have a dedicated ground.

It is recommended that separate mains circuits, (individually protected by fuses or circuit breakers) are used for each component in the system such as the water chiller, autosampler and printer.

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

Local regulations in several European countries do not permit the use of a breakable wall-mounted power supply connection for high current single-phase mains supplies. In these areas, the mains power supply to the Agilent 700 Series ICP-OES should be hardwired to the wall.

Electrical Requirements

Table 4 System electrical specification

System unit	Required supply voltage	Nominal rating
Spectrometer	208 VAC	5.1 kVA
	220 VAC Equivalent to 230 VAC	
	240 VAC Equivalent to 230 VAC Frequency 50/60 Hz	
Water chiller (typical)	220–240 VAC, 50 Hz 120 VAC, 60 Hz	1450 VA 1645 VA
SPS 3 Sample Preparation System	100–240 VAC, 50–60Hz	~220 VA
VGA 77	100 VAC 120 VAC	24 VA
	220 VAC Equivalent to 230 VAC	
	240 VAC Equivalent to 230 VAC Frequency 49–61 Hz	
SVS 1	100–240 VAC, 50–60 Hz	1.5 A
SVS 2	100–240 VAC, 50–60 Hz	1.8 A

Spectrometer Power Connections

Table 5 Spectrometer power connections

Power supply phase	Single
Cable rating.	600 VAC, 30 A, 4.3 m (14.1 ft) length

	Plug supplied	Required wall socket
For U.S., North, Central and South America, Japan, Korea and Taiwan	NEMA L6-30P	NEMA L6-30R
All other countries	IEC 60309 plug	IEC 60309 outlet

Two or Three Phase System Requirement

The Agilent 700 Series ICP-OES draws a maximum of 28 amps RMS at 187 volts with a power factor of approximately 0.70. In areas where 208 to 240 VAC single phase power supplies are not available at the required rating, two active phases from a two or three phase system may be used with a 380/415 volt phase-to-phase, to 220 volt single phase step-down transformer.

IEEE 488

NOTE

Basic insulation is provided for single fault protection on the IEEE connector.

Fuses

1FS1 and 1FS2	T6.3 AH 250 V, IEC 127 sheet 5, 5 x 20 mm
1CB1	Circuit breaker 30 A Fast trip

NOTE

For safety reasons, any other internal fuse or circuit breaker is not operator accessible, and should only be replaced by Agilent-authorized personnel.

Fuse information on the rear of the instrument is the most up-to-date.

Gas Supplies

The installation of compressed or liquid gas supplies must comply with the rules and/or regulations imposed by the local authorities responsible for such use in the workplace.

The responsible body must carry out leakage tests necessary for safety on gas connections.

Liquid or gaseous argon and nitrogen may be used with the Agilent 700 Series ICP-OES system. Agilent recommends the use of liquid gases, which are usually higher purity, more convenient and cheaper per unit volume.

NOTE

Either argon or nitrogen gas may be used as an optics purge gas on the Agilent 700 Series ICP-OES systems.

The main gas supply requirement is argon for supply to the plasma, nebulizer and optics interface purge. Gas is also required to purge the polychromator assembly, and this may be either argon or nitrogen. A separate gas line connects internally to the argon supply unless the optional nitrogen purge kit is fitted (field-fitted only).

Table 6 Argon and nitrogen gas specifications

	Argon	Nitrogen (if nitrogen is used to purge the polychromator)
Purity	99.996%	99.996%
Oxygen	<5 ppm	<5 ppm
Nitrogen (argon only)	<20 ppm	-
Water vapor	<4 ppm	<4 ppm
Permissible pressure range	400–600 kPa (57–88 psi)	
Recommended pressure	550 kPa (80 psi) regulated	

Table 7 Typical flow rates for the Agilent 700 Series ICP-OES instruments

	Argon (with argon purge gas)	Nitrogen (as purge gas)
Standby mode	0.75 L/min	Nitrogen flow 0.45 L/min
Operational range (plasma on)	9–32.8 L/min	Argon flow 8.3–29.1 L/min Nitrogen flow 0.45–2.1 L/min
Typical flows		
Measuring wavelengths > 200 nm (poly boost off)	13.5 to 21.75 L/min	Argon flow 12.75 – 21 L/min Nitrogen flow 0.45 L/min
Measuring wavelengths < 200 nm (poly boost on)	15.75 – 24 L/min	Argon flow 12.75 – 21 L/min Nitrogen flow 2.1 L/min

The Agilent 700 Series ICP-OES is fitted with a PTFE gas supply hose, 1.8 meters (6 feet) in length fitted with 1/4 inch Swagelok hardware.

Fittings for the regulator end must be supplied by the customer. Alternatively, a fittings kit can be ordered from Agilent Technologies. See the Agilent website at www.agilent.com for ordering information.

Customers will provide connection from the gas supply to a shutoff valve.

Customers must provide pressure regulators for the gas cylinders. When ordering, consider the size of the output tubing, 1/4 inch (6.4mm), and also the Compressed Gas Association (CGA) number.

If the Nitrogen Purge option is purchased, additional fittings will be supplied to connect the gas to the ICP-OES.

Storage Cylinder Instructions

Cylinders containing gas under pressure should be firmly secured to a rigid structure, and the storage area must be adequately ventilated.

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 predetermined temperature, usually around 52 °C (125 °F).

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, pressure gauges and suitable regulators, which are easily accessible to the instrument operator. The gas outlets must be provided within 1.5 meters (5 feet) of the instrument.

Cryogenic Liquids

Cryogenic liquid gases are stored under pressure at very low temperatures in Portable Liquid Cylinders (PLC).

WARNING



Extreme Cold
Contact with the super-cold liquid, gas or pipe surfaces can cause severe skin damage. The Portable Liquid Cylinders should be located in a shielded position, and all piping should be routed or covered to prevent skin contact.

For high gas flow rates and/or low ambient temperatures, it may be necessary to obtain sufficient gas pressure by passing the liquid through an external evaporator rather than use the internal pressure building facility of the PLCs.

Liquid argon and liquid nitrogen may *not* be stored for extended periods and often have special storage requirements. Contact your local authorities and cryogenic gas supplier for more detailed information on storage requirements and boil-off rates for local types of PLCs.

Water Chiller System

Agilent 700 Series ICP-OES instruments require a source of cooling water. The water chiller system needs to remove up to 200 watts for radial instruments and 950 watts for axial instruments. The cooling water is required for the load coil and camera Peltier assembly. Axial instruments also require cooling capacity for the

sample cone interface. The instrument incorporates an in-line particulate filter and water flow sensor on the water supply line.

Provided that the flow rate can be maintained above 1.1 L/min, and maximum supply pressure is below 310 kPa (45 psi), the cooling water supply may be taken from an in-house domestic water system, if local regulations permit.

An alternative is to install a recirculating water chiller system. The system should provide cover for the reservoir to prevent evaporation and stop contamination by dust or other impurities. Algaecide should be used to prevent algae growth that may restrict the flow of cooling water through the system.

A recirculating water chiller system has the advantage of reducing the volume of water that will be required over the life of the instrument's operation. Because of the limited size of the water chiller's reservoir, in the case of accidental damage the amount of water damage that can occur will also be limited.

The G8481A Agilent Water Chiller can be used and will ensure the continued delivery of temperature controlled coolant, at the correct pressure, with a minimum of long-term maintenance or operational expense.

Installation of the required power connections and unpacking of the chiller/recirculator must be performed prior to installation of the instrument.

Table 8 Agilent 700 Series ICP-OES chiller requirements

Requirement	Parameter
Cooling capacity	Axial system: 1 kW Radial system: 200 W
Flow rate	1.1 L/min (0.3 gpm) minimum
Recommended inlet temperature	20 °C (68 °F) (Maximum for Agilent 720 Series ICP-OES: 30 °C (86 °F) (Maximum for Agilent 710 Series ICP-OES: 45 °C (113 °F)
Minimum inlet pressure	55 kPa (8.0 psi)
Maximum inlet pressure	310 kPa (45 psi)

NOTE

Pressure regulation is recommended for water chiller systems that may exceed the maximum permissible pressure of 310 kPa (45 psi) or may be subject to pressure fluctuations.

The instrument is equipped with a water flow sensor, which will stop operation of the plasma and camera Peltier assembly if the cooling water flow through the instrument drops below 1.1 L/min (0.3 gpm).

CAUTION ***Always*** **ensure the water cooling system is on before igniting the plasma.**

Location

Many water chillers are designed to be located and operated indoors. Consult the water chiller's literature for more information before installing.

The coolant supply and return hoses of the Agilent 700 Series ICP-OES are 3.0 meters long (10 feet). The inner diameter of the return hose is 7 mm (1/4 inch). The inner diameter of the supply hose is 9.5 mm (3/8 inch). The supply and return connection to the water cooling source will require suitable metal barbs that accommodate these diameter hoses. For most countries, the appropriate barbs for connecting the instrument to the water chillers are included with the instrument in kit form.

Please see the Agilent website for part numbers for ordering additional hose by the meter and clamps: www.agilent.com

Waste Fluid Container

Operation of the Agilent 700 Series ICP-OES system requires the use of a drain vessel for the disposal of excess fluids and vapors from the spraychamber. Suitable tubing is supplied with the spectrometer for use with inorganic solvents. When using organic solvents, different drain tubing that is suitable for the solvent in use will be required.

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

Contact your waste management facility for information on how to dispose of all spectrometer waste in accordance with local regulatory requirements.

Guidelines for Software Installation

Agilent recommends that you purchase a PC as part of the Agilent 700 Series ICP-OES package. The PC included in the package will come with the appropriate operating system as loaded by the PC supplier.

For instructions on installing the Microsoft Windows operating system, refer to the appropriate manuals supplied with the software. It is the responsibility of the customer to ensure that the operating system software has been installed and is functional if the customer is supplying the PC or the operating system.

NOTE Agilent will not assume responsibility for loss of data.

For information on installing the Agilent 700 Series ICP-OES system software, consult the ICP Expert II software installation instructions for Microsoft Windows 10 Professional 64-bit supplied with the instrument software.

5 Accessories and Options

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For detailed instructions and site requirements see the documentation supplied with the accessory.

Organic Solvents or Hydrofluoric Acid

If organic solvents or hydrofluoric acid are intended to be used with the instrument, then special tubing and fittings are required.

Please refer to the Agilent Technologies website for details and part number information.

NOTE The special fittings supplied for use with organic solvents and hydrofluoric acid may not be suitable for acidic or alkaline solvents. The standard (originally supplied) components should be retained for use in these applications.

Auxiliary Gas Module

The AGM 1 is an accessory used to introduce a small amount of oxygen into the plasma of an Agilent 700 Series ICP-OES.

The oxygen facilitates the analysis of volatile organics by ICP techniques by reducing carbon buildup and background signal resulting in lower detection limits when analyzing volatile organic solutions.

The AGM 1 is generally used in conjunction with the cooled spraychamber. This allows you to directly analyze, without dilution, organic solutions with a high vapor pressure at room temperature such as gasoline and naphtha. Cooling of the sample prevents high vapor pressures being generated in the spraychamber, which can cause back pressure in the chamber, destabilizing the plasma and suppressing the analytical signal.

The cooled spraychamber requires a chiller capable of cooling the spraychamber to approximately -10 °C. This chiller is *not* included with the AGM 1, cooled spraychamber or organics kits.

The AGM 1 unit features an on/off switch, a flow control knob and a flow indicator.

Gas Requirements

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 in the workplace.

Table 9 AGM 1 gas supply requirements

Requirement	Parameter
Permissible pressure range	300–700 kPa (43–101 psi)
Recommended pressure	300 kPa (43 psi)
Required flow rates	Up to 0.6 L/min

Cooled Spraychamber Organics Kit

The cooled spraychamber comes in a kit with tubing and attachments.

You will need to provide a chiller capable of cooling to approximately -10 °C and tubing to connect the chiller to the spraychamber.

The Organics kit will include the following components:

- Peristaltic pump tubing organics Black (sample)
- Peristaltic pump tubing organics Grey (drain)

- Transfer tubing for use with gasoline
- Nebulizer holder*
- O-ring (for nebulizer)*
- O-ring kit (for nebulizer holder)*
- Spraychamber tubing to drain
- Drain tubing
- Cooled spraychamber
- Mounting bracket
- Instruction sheet

* These items are assembled as one unit.

Sample Preparation System (SPS 3)

The SPS is compatible with a wide range of commercially available low-cost autoclavable sample racks.

Sample contamination from airborne particles is eliminated and corrosive or toxic fumes are removed during sampling with the optional environmental enclosure.

Environmental Conditions

The SPS accessory is suitable *only* for indoor use. The site should be selected to avoid dusty or corrosive atmospheres.

NOTE

Extra maintenance may be required on the SPS if it is operated in excessively dusty or corrosive conditions.

An Agilent-supplied trolley is available for the SPS. A drain vessel must also be accommodated.

Vapor Generation Accessory Recommended Gases

The VGA is fitted with 6 mm (1/4 inch) internal diameter flexible hose for connection to a standard barbed tail connector, which must be supplied by the customer.

CAUTION **The gas supply for the VGA must be a separate regulated line, to prevent exceeding the maximum inlet pressure to the VGA.**

NOTE The VGA allows a 45 mL/min flow of argon to pass through it even when it is switched off. It is recommended that the argon gas line is fitted with a stop valve to shut off the gas supply to the VGA.

Table 10 VGA gas supply requirements

Requirement	Parameter
Permissible pressure range	300–400 kPa (42–57 psi)
Recommended pressure	350 kPa (50 psi)
Required flow rates	Up to 100 mL/min

SVS 2 Productivity Package Accessory

Operated in conjunction with the fast uptake pump, which is dedicated to filling and emptying a sample loop, the 11-port, two-position switching valve of the SVS 2 accessory is triggered by the ICP Expert II software commands to the autosampler that results in much faster sample throughput for your Agilent ICP-OES system.

The SVS 2 can be used directly with the Agilent SPS 3, AIM 1250, AIM 3600, Cetac 500 series autosamplers.

In This Book

The manual describes the following:

- Safety Practices and Hazards
- Laboratory Environment Requirements
- Instrument Transit Information
- Laboratory Facilities Requirements
- Accessories and Options

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