

## Universal Spray Chamber Instruction Sheet

The Spray Chamber Assembly is intended for analyses involving aqueous or organic solvents.

The assembly consists of:

- spray chamber
- nebulizer bung
- pressure relief bung
- mixer paddles
- liquid trap
- float

The kit does not include a burner or nebulizer.

The spray chamber is made of fluorinated high density polyethylene (FHDPE) and is identified by its white color. The pressure relief bung and drain tube are made of white FHDPE. The mixer paddles, sealing gasket, liquid trap and float are made of blue colored FHDPE. The nebulizer bung is made of polytetrafluoroethylene (PTFE) fitted with a ceramic face.

### NOTE

This instruction sheet replaces the sections titled 'Spray Chamber (Organic Solvents)' in the SpectrAA-10/20, SpectrAA-30/40 and SpectrAA-300/400 operation manuals. You should mark the section in your manual to indicate this. If you have a SpectrAA-250 Plus, then read this instruction sheet in conjunction with Section 3.1 'Spray Chamber' in your operation manual.

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## Safety Practices

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### WARNING

#### Explosion and Fire Hazards

Improper use of the spray chamber can create explosion hazards and fire hazards, which can result in death or serious personal injury.



When using this spray chamber, ALWAYS observe the following requirements.

### Bungs

The nebulizer bung and pressure relief bung supplied with this spray chamber have both been specifically designed for use with organic solutions. The nebulizer bung is made of PTFE and the pressure release bung from FHDPE. Both bungs are identified by a circumferential groove; the nebulizer bung is further identified by its green locking handle.

### CAUTION

NEVER use standard bungs in this spray chamber, as they will be distorted by organic solvents. Use ONLY the special bungs supplied.

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### O-Rings

O-rings supplied for the normal spray chamber are NOT recommended for use in the universal spray chamber, as the organic solvents will cause swelling and possible dissolution.

White o-rings (made from a fluoroelastomer) are fitted to this spray chamber where they are liable to come into contact with solvents. They have a much higher resistance to organic solvents than conventional o-rings.

All o-rings fitted to the spray chamber/burner system may eventually become distorted or damaged. Inspect ALL o-rings regularly, including those fitted to the fuel and oxidant nipples. Immediately replace any o-ring that is distorted or damaged. Locations for the white fluoroelastomer o-rings are shown below. Locations of other o-rings (and replacement details) are given in:

- The operation manual supplied with your spectrometer.
- Publication 'Nebulizers For Atomic Absorption Spectrometers' supplied with your nebulizer.

A complete set of replacement o-rings is available from Agilent as a kit. This kit includes the white fluoroelastomer o-rings plus standard replacements for the remainder of the nebulizer/burner system. For the most current part numbers please see the Agilent Technologies website at [www.agilent.com](http://www.agilent.com).

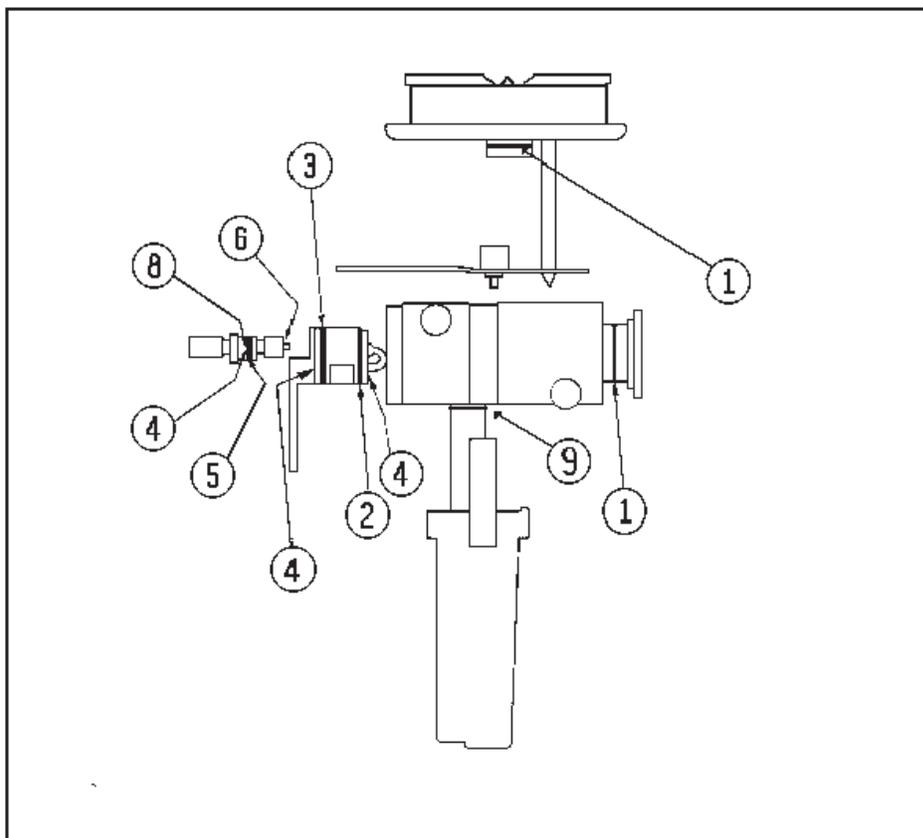


Figure 1. Universal spray chamber parts

Table 1. O-ring location

Item	Dimensions	Material	Position	Quantity
1	ID 15/16 in x OD 1 1/8 in x 3/32 in	White fluoroelastomer	Burner bowl, pressure relief bung	2
2	ID 1 1/8 in x OD 1 1/4 in x 1/16 in	White fluoroelastomer	Nebulizer bung	1
3	ID 1 1/4 in x OD 1 3/8 in x 1/16 in	White fluoroelastomer	Nebulizer bung	1
4	ID 3/16 in x OD 5/16 in x 1/16 in	White fluoroelastomer	Capillary guide, glass bead, glass bead screw	3
5	ID 3/8 in x OD 1/2 in x 1/16 in	White fluoroelastomer	Nebulizer body	1
	ID 1/4 in x OD 3/8 in x 1/16 in	White fluoroelastomer	Nebulizer venturi	1
8	ID 0.74 mm x 1.02 mm thick	Black nitrile	Capillary assembly	1
9	ID 11/16 in x OD 13/16 in x 1/16 in	White fluoroelastomer	Drain tube	1

### Float

Do not use a standard float with this spray chamber. The float for this spray chamber is also made of FHDPE indicated by its blue color.

It is used with organic solutions as well as aqueous solutions. Note, however, that some organic solvents may permeate the FHDPE. If this occurs:

- The float may be distorted, in which case free movement within the liquid trap will be prevented.
- The float may leak and lose buoyancy.

Check your float regularly for correct flotation and free movement within the liquid trap. Refer also to the 'Maintenance' section.

Faulty floats must be replaced immediately. Spare floats and liquid traps are available from Agilent.

### **Drainage and Venting System**

The standard plastic laboratory tubing supplied with your spectrometer is NOT suitable for draining organic solvents or venting organic vapors. You should always use solvent-resistant tubing such as silicone rubber for both the drainage system and the vapor vent. Always clamp both tubes to their respective outlets on the liquid trap, otherwise they may distend and fall off.

Lead the drainage tube from the lower outlet on the trap to a suitable wide-necked waste vessel. The free end of the tube must not be submerged below the liquid in the waste vessel. DO NOT use glass waste vessels; use vessels made of a material that will not shatter in the event of a flashback. Locate your waste vessel in an open well-ventilated area where you can see it. Never locate the vessel in a confined space. Use small waste vessels and empty them frequently. Do not accumulate large volumes of flammable solvent. When your analytical program has been completed, or at the end of each working day, always ensure that you do not leave hazardous solutions standing in the waste vessel.

Lead the vent tube from the upper outlet on the trap to a location where flammable vapors can be safely discharged in accordance with local regulations.

Solvent-resistant tubing may be obtained by the meter from Agilent.

### **Adjustable Nebulizer**

Because of the fuelling effect of organic solvents, it is strongly recommended that you use an adjustable nebulizer for all analyses involving organic solutions. The appropriate item for your spectrometer can be obtained from Agilent as 'Barrel Nebulizer, Adjustable'.

### **Standard Practices**

Remember at all times that the combination of a flame and flammable solvents can present a serious hazard. All relevant safety practices governing the use of flammable solvents must be strictly followed. Refer also to the Safety Practices section of your spectrometer operation manual.

### **Maintenance**

Do not leave organic solutions standing in the liquid trap whenever the system is to be left unused for more than 48 hours.

At least once per week, clean the liquid trap, spray chamber and bungs thoroughly with alcohol or other appropriate solvent so that all analytical residues are removed.

When re-assembling the spray chamber, take a tiny amount (for example, the size of a pin head) of PTFE-based grease and apply this to each o-ring. Smear the grease around the o-ring by rotating it between your fingers. Silicone greases are the next most suitable for this application.

## Installation

### To install the universal spray chamber:

- 1** Replace the nitrile o-ring on the base of a Mark VI burner with the appropriate white fluoroelastomer o-ring (Item 1 in Table 1). To use a Mark V burner, replace the ratchet type handle with the handle/collar assembly from an existing Mark V spray chamber, after first replacing the black nitrile o-ring on the assembly with the spare white fluoroelastomer o-ring in the kit.  
  
Discard the nitrile o-ring.
- 2** Replace the nitrile o-ring on the venturi of the nebulizer with the appropriate white fluoroelastomer o-ring (Item 6 in Table 1).  
  
Discard the nitrile o-ring.
- 3** Refer to the 'Instrument Assembly' section of your spectrometer operation manual.

**NOTE**

SpectrAA-250 Plus users: Refer to Chapter 3 'Flame Hardware Description and Setup'.

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- a** Remove the standard spray chamber assembly exactly as described.
- b** Refer to the instructions for fitting a standard spray chamber assembly and fit the organic spray chamber assembly in exactly the same way. Observe all warnings and cautions. Ensure that you use solvent-resistant tubing for drainage and venting as described earlier in this publication ('Drainage and Venting System'). Also refer to 'Standard Practices'.

## Operation

The universal spray chamber is used in the same manner as the standard Mark VI spray chamber. However as both aqueous and organic solvents can be used, the spray chamber and liquid trap **MUST** be emptied and rinsed with alcohol or acetone when changing solvent types. This is to ensure complete removal of the previous solvent before commencing operation with the new solvent.

The liquid trap must be filled with the solvent being used to aspirate the analytical solutions.

This information is subject to change without notice.



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