PFA 260 Manual

Liability Note: The manufacturer assumes NO liability for damage however caused in the handling & usage of the nebulizers. Use at your own risk.

Caution: Do Not Handle unless you are sure that the nebulizer is dry, or washed with clean water. Acids, particularly HF, often look like water and will wet the end of the nebulizer during usage.

Warning: This device operates on compressed gases. Appropriate care must be taken. If in doubt about correct operating procedures, call an experienced operator or call Burgener Research at +1 905 823 3535.

Please Note: Burgener PFA 260 Nebulizers require 60 psi to have a 1 liter per minute of Argon gas flow, so the operating pressures are in the range of 40 - 70 psi, depending on the torch optimum flow rate. Flow rates below 0.6 L/min do not provide good %RSD. **Please optimize above 0.6 L/min nebulizer gas flow.**

Minimizing Pulsations: PFA 260 Nebulizers will pulse if the pump can not deliver constant sample flow. Change your pump tubing often, or use a surgeless pump if possible. A Syringe Pump or Gravity feed system will also work.

DO NOT TOUCH THE TIP! The gas orifice at the tip of the nebulizer is PFA, and is SOFT. This tip is very easily damaged and should NEVER be touched with fingers, tissues, or anything else. If the tip is accidentally touched, and the nebulizer continues to operate, then it is still functional, and its use can be safely continued.

It is recommended that the red Nebulizer safety cap is kept on the Nebulizer while not in use. This will protect the tip from accidental damage.

Dropping and Breakage: Burgener Nebulizer bodies are strong and generally will not break. If a nebulizer is dropped such that the tip is deformed, then it will be irreparably damaged. If it continues to operate after being dropped, then it has not been affected, and it is safe to use.

Operating Instructions

Your new Burgener PFA 260 Nebulizer is unique. It should give you a long and convenient service on most solutions. The operation and care of your nebulizer is different from most other nebulizers in several important ways.

1. Solutions and Solvents
The PFA nebulizer only has PFA wetted parts, so it can handle almost all liquids.

2. Sample Introduction / Maximizing Stability
Burgener PFA 260 Nebulizers do not have any suction, so they require a pump to supply the sample solution. The pump speed and the quality of the pump tubing have a large effect on the stability of the nebulizer. Try to select a pump tubing size that allows running the pump at a high speed. Pulsations occur if the pump can not deliver constant sample flow. Change the pump tubing often: usually once a day for maximum stability and lowest %RSD.

3. Sample Capillary Tubing
The Sample line extending from the back of the nebulizer is the same capillary extending to the tip of the nebulizer. This capillary tubing IS the nebulizer. The rest is just a housing enabling you to handle it. If you pull vigorously, you may be able to remove the capillary tubing. However, it is IMPOSSIBLE to replace it. Once the inner capillary tubing is moved backwards even a little, the nebulizer is destroyed. Do NOT pull on the capillary tubing. The sample line is a bit less than 1/16" OD. If a particle bocks the sample line, it will usually be at the beginning of the sample line since the ID increases as it enters the nebulizer, so you can cut a bit off the beginning and clear the blockage that way.

4. Low Flow Operations
The PFA 260 can run on very low flow rates FOR SOME LIQUIDS. Water and liquids with high surface tension are more difficult than liquids with low surface tension such as Alcohol. To run below 50 microliters per minute, you may need to add 10% Alcohol to your solutions to decrease the surface tension and you probably need to run 1 l/min Argon flow. Lower Argon flow rates may not work for very low flow sample rates.

5. The Gas Line
The gas line is attached with UpChurch(r) 10/32 "Fingertight" fittings. We supply 2mm OD X 1mm ID Teflon tubing. A gas line filter is NOT included in the nebulizer. Any particles from the gas line will destroy the nebulizer, so please ensure that the gas line to the nebulizer is clean of any particles. If while replacing the gas lines you detect a leak, tighten the gas fittings HARD.

6. Humidified Argon
It does not matter if the Argon is humidified or not.

7. Nebulizer Pressure

The Burgener PFA 260 Nebulizer operating pressure is determined by the torch. Torches require 0.6 to 1 liter per minute. The pressure varies with each nebulizer, but the flow should be almost the same for an individual torch. Each nebulizer should be tested by looking for the pressure which gives optimum precision. This will generally be found to be a narrow range. An initial pressure can usually be found by observing the central channel of the plasma while aspirating a solution of 1,000 ppm Y. Adjust the pressure until the red tongue is just level with the upper turn of the work coil. This is easy to observe with a relatively new torch, but, once the torch becomes discolored, it may be difficult to see this tongue. In this case, the alternative is to begin at about 30 psi and increase at 2 to 5 psi intervals until the best precision is found.

8. Nebulizer Orientation - Rotate to Optimize

Some nebulizers are sensitive to orientation. The gas flows from the nebulizer at a bit of an angle, and this affects the flows in chambers, especially cyclonic chambers. Be sure to check orientation once the apparently optimum nebulizer pressure has been found to determine which gives the better results. For the orientation check, rotate the nebulizer in 45 degree increments and check for a gain in precision. For most PFA 260 nebulizers, rotation only has a small effect.

9. Washing Your Nebulizer - Salting

For the longest life and best performance, wash your nebulizer by simply running water as a sample for 10 minutes at the end of the day before shutting down the plasma. Any other form of washing is usually unnecessary. Teflon does not wet, so salts rarely occur.

10. Unplugging the Sample Line

If the capillary from the sample to the nebulizer is plugged, it is difficult to clear it. You may try a back flush, but generally particles that stick imbed themselves into the soft PFA Teflon. If the nebulizer itself is plugged, it is probably NOT repairable. It may be possible to clean out particles with a .003 " cleaning wire, but the inner capillaries are very soft, and cleaning wires are more likely to damage the capillaries instead of removing a particle. Caution: You MUST use a microscope to do this. The gas orifice is about the same size as the sample hole. If you TOUCH the gas orifice, you will destroy the nebulizer. To clean out a blockage, push a .003" OD wire from the front of the nebulizer until it sticks out the back capillary, but it must be smooth or rounded at the tip or it will catch and tear the insides apart.