OPERATING INSTRUCTIONS

BURGENER ARI MIST NEBULIZER

US Patents # 5,411,208; 6,634,572 Canadian Patents # 2,112,093; 2,384,201

LOW FLOW ENHANCED PARALLEL PATH ICP NEBULIZERS

SAMPLE FLOW FROM .05 to 1.0 ml/min

ROBUST DESIGN, INERT TEFLON CAPILLARIES

ATOMIZES ANY LIQUID, ANY SALT LEVEL

Produced in Canada by:

Burgener Research Inc.

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3 MONTH SATISFACTION WARRANTY

For 3 months after receiving it, if you are not satisfied with your Burgener Nebulizer, Burgener Research will repair, replace or refund your nebulizer, at your request.

CAUTION:

Do Not Handle unless you are sure that the nebulizer is dry or washed with clean water.

Burgener Research Inc. does not warrantee the nebulizer beyond the purchase price. The Manufacturer and Agent(s) assume NO liability for damage however caused in the handling and usage of the nebulizers. Use at your own risk. If in doubt about correct operating procedures, call an experienced operator or call Burgener Research at (+1) 905 823 3535.

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.

IMPORTANT

1. Handling

The gas orifice is at the very tip of the nebulizer. It is made of PTFE Teflon which is VERY 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.

2. 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.

ARI MIST Operating Instructions

Your new Burgener 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 Ari Mist internal PTFE capillaries handle almost all liquids. But the Peek bodies are attacked by some acids: Sulphuric, Perchloric, Bromidic, high HF, and by a few organic solvents. If in doubt, check the internet for Peek's resistance to the liquid.

2. Sample Introduction / Maximizing Stability

Burgener 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 and Fittings

Sample lines are attached with Idex style 10/32 "Fingertight" fittings. **TIGHTEN THE SAMPLE LINE GENTLY** - it can close the capillary line if over tightened. We supply .062" OD X .010" ID PTFE capillary tubing. You may use any tubing that fits an Idex 10/32 Fingertight fitting. We recommend that you use .010" ID or smaller for the sample line. This should catch any particles before they get into the nebulizer. It is much safer & easier to replace the capillary tubing than to clean the nebulizer.

4. Low Flow Operations

The Ari Mist 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 100 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 Idex style 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 line fitting HARD.

6. Humidified Argon

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

7. Nebulizer Pressure

Burgener Nebulizer operating pressure is determined by the torch. Torches require 0.6 to 1.2 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 effects 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. Usually, 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. IF you do run high sodium samples, a run of 10% HF as a sample once a week should remove any salt build up. Ultra Sonic baths usually do not clean the nebulizer and may introduce particles into the gas line.

10. Unplugging the Sample Line

If the capillary from the sample to the nebulizer is plugged, it can be easily unscrewed and replaced. **If the nebulizer itself is plugged, it is probably NOT repairable.** It may be possible to clean out particles with a .008 " 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 larger than the sample hole. If you TOUCH the gas orifice, you will destroy the nebulizer. To clean out a blockage, push a .008" OD wire from the front of the nebulizer until it sticks out the back.