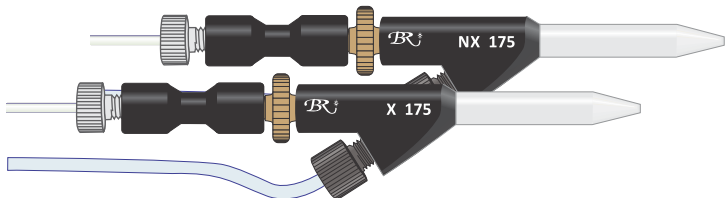




OPERATING INSTRUCTIONS

BURGENER X-175 & NX-175 NEBULIZERS

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



LOW FLOW ENHANCED PARALLEL PATH ICP NEBULIZERS

The NX-175 is Optimized for Perkin Elmer NexION: 1.2 L/min @ 50 psi

The X-175 is Optimized for ICP-MS: 0.8 L/min @ 50 psi

SAMPLE FLOW FROM 5 to 1500 μ l/min

Produced in Canada by:

Burgener Research Inc.

1680 - 2 LAKESHORE ROAD W., MISSISSAUGA, ONTARIO, CANADA L5J 1J5

PHONE: +1 905 823 3535 EMAIL: BURGENER@BURGENER.COM

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.

IMPORTANT

1. Handling

The gas orifice is at the very tip of the nebulizer. It is made of PEEK which 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.

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.

X-175, NX-175 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 X-175 & NX-175 internal PEEK capillaries handle almost all liquids. But the Peek can be 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 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 Teflon 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 X-175 & NX-175 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. For Single Cell operations you

will need to run flows around 0.010 ml/min or less to maintain a dry chamber.

5. The Gas Line

The gas line is also attached with IDEX 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 harder.

6. Humidified Argon

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

7. Nebulizer Pressure

Nebulizer operating pressure is usually determined by the torch. The X-175 needs 50 psi for a 0.8 L/min flow, and the NX-175 needs 50 psi for 1.2 L/min as required by the NexION. Torches optimize at Argon flows between 0.5 to 1.2 liters per minute. For lowest flows, you may need to run higher Argon flow than the best torch optimum, or you may get spitting instead of a steady mist. For higher flow operations, you may optimize a torch and nebulizer by testing different pressures to find 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. Then try several settings above and below that. Alternatively, begin at about 40 psi and increase at 2 psi intervals until the best precision is found.

8. Nebulizer Orientation - Rotate to Optimize

For LOW FLOW operations, ideally use a straight chamber such as a Scott, NOT a cyclonic. If using a cyclonic, some nebulizers are sensitive to orientation. The gas flows from the nebulizer at a bit of an angle, and this effects the flows in cyclonic chambers. Check the orientation once the optimum nebulizer pressure has been found by rotating the nebulizer in 45 degree increments and check for a gain in precision.

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.

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. Cleaning wires are too thick to fit into the sample line capillary. The X-175 and NX-175 can not handle undissolved particles. If you have samples with particles that may plug the nebulizer, we suggest you use our Mira Mist Nebulizers instead.