Mira Mist CE 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 Mira Mist CE Nebulizers require 80 - 90 psi to have a 1 liter per minute of Argon gas flow, so the operating pressures are in the range of 45 - 95 psi, depending on the torch optimum flow rate.

Minimizing Pulsations: Mira Mist CE 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.

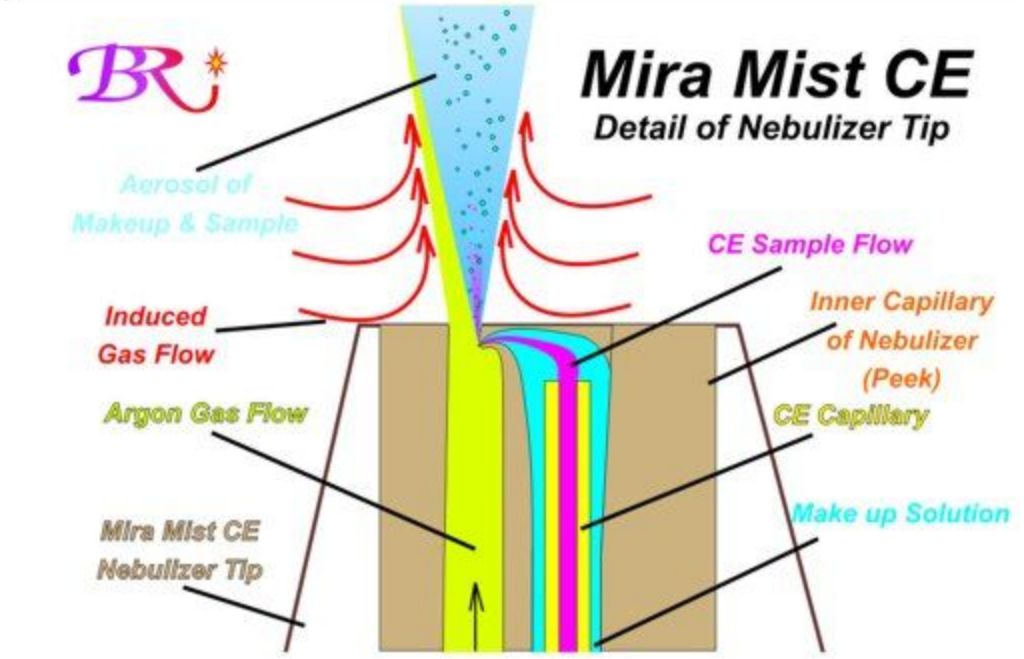
DO NOT TOUCH THE TIP! The gas orifice at the tip of the nebulizer is Peek, and is SOFT. This tip is very easily damaged and should NEVER be touched with fingers, tissues, or anything else. If the tip is accidentally touched, and the nebulizer continues to operate, then it is still functional, and its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

Removal of the gas line: Please note that the PTFE body has threads that are soft and easily cross threaded. Please leave the Peek fittings in the Teflon body for the gas line and for the sample line, or very carefully screw them in when changing them.


Close up of tip of Mira Mist CE
Showing CE Capillary beside gas orifice


Mira Mist CE
Detail of Nebulizer Tip
Aerosol of Makeup & Sample
CE Sample Flow
Induced Gas Flow
Inner Capillary of Nebulizer (Peek)
Argon Gas Flow
CE Capillary
Make up Solution
Mira Mist CE Nebulizer Tip

Operating Instructions

The Mira Mist CE is the most convenient and best CE interface available.

The Burgener Mira Mist CE Nebulizer has no suction or back pressure on the CE capillary, and provides nearly instant delivery of the solution to the torch. The Nebulizer's large sample passage ID enables the CE capillary to pass through the nebulizer to its tip. As soon as the sample flows from the CE capillary, it is swept into the gas stream and atomized. With flows below 15 microliters per minute, the chamber stays dry and the aerosol is delivered immediately to the torch. You get 100% sample delivery to the torch, with virtually no background interferences. With a dry chamber there is no washout time, so the response is as quick as if the CE capillary extended into the plasma.

1. Operating Pressure
The Mira Mist CE Nebulizer can operate at very low flow rates when run at 70 to 90 psi. High pressure is required to maintain low flow. As the pressure is lowered, higher flows are required to maintain a good mist. It will not run low flow at lower pressures.

2. Makeup Flow Rate
As long as the nebulizer makeup solution is running at 10 æl/min or less, there should be no drops forming in the mini chamber. If the flow rates exceed 15 æl/min, drops will form and the washout time will rise from less than 1 second to 30 to 45 seconds. You will not get good results if the inside of the chamber becomes wet. The makeup solution needs to flow at a constant rate. All of the CE solution is swept to the plasma with the makeup flow, and the signal intensity should remain constant even with minor variations in the makeup flow rates. However, our experience has shown that changes in the makeup flow do effect the signal. To achieve a constant makeup flow rate, use gravity feed systems or a precise syringe pump. Note that air bubbles can block the makeup flow.

3. Make Up Solution
The make up solution can be almost any conductive liquid. The nebulizer is made of PEEK and PTFE, and is safe for almost all liquids, except for H_2SO_4, high acid concentrations and some solvents. The nebulizer runs very low flows for liquids with low surface tension. Water has very high surface tension and the Mira Mist CE will not give good results for 10æl/min or less on pure water. Add 10% alcohol, Amonium Nitrite or a similar liquid to your makeup solution to reduce surface tension to allow the nebulizer to produce a good aerosol for the low flow rates required by the CE system.

4. Replacing the Makeup Capillary

The makeup liquid is delivered to the nebulizer through a Pt tube in the T fitting. This ensures that the makeup solution makes good contact with the electrode. The makeup solution capillary is held in place with a short length of larger Orange/Orange size Tygon peristaltic pump tubing. To replace the makeup capillary, pull out the old one and press the new one into the larger tubing on the Pt tube. You can fit capillary tubing from 0.040" to 1/16" (0.0625").

5. Electrode Voltage Caution

Always use the GROUND for the electrode on the nebulizer. High voltages are dangerous. Even if the electrode is protected, the rest of the system is conductive due to the conductive makeup solution.

6. Installing the CE Capillary into the Mira Mist CE

The Mira Mist CE will allow a 360 micron glass capillary to pass easily through the nebulizer. If the edges of the CE capillary are sharp, or rugged, then you may damage the insides of the nebulizer. The insides are made of Peek, which is fairly strong, but can be damaged with sharp glass. The CE capillary is passed through the orange sleeve to be secured by the UpChurch fitting, then it is passed through the T fitting, through the coupling, and into the nebulizer. Push the Glass capillary SLOWLY, while rotating SLOWLY until it extends out the front of the nebulizer. If you feel resistance, remove it and check for sharp edges that may be catching inside the nebulizer.

The capillary should be pulled back into the nebulizer, but only enough so that the liquid from the make up solution will cover the tip of the CE capillary at all times. About 1 mm or 1/8 inch is necessary. If you pull it back too much, the response time increases. If you do not pull it back far enough, you will have poor contact between the makeup solution and the electrode. When the capillary is placed properly, tighten the fitting at the back of the T so that it does not allow the glass capillary to move.

To simplify changing the CE capillary, some have installed a short CE capillary in the nebulizer, and then used glass capillary couplings to attach the capillary from the CE instrument to the nebulizer's CE capillary.

Final Checklist:

Use Ground on electrodes, not high Voltages.

Use 10% + Alcohol in Makeup solution.

Push CE Capillary in very carefully while twisting slowly.

Run at 10 æl/min or less to avoid drops forming in the chamber.

Use 75 - 90 psi (6 bar) for nebulizer Argon.