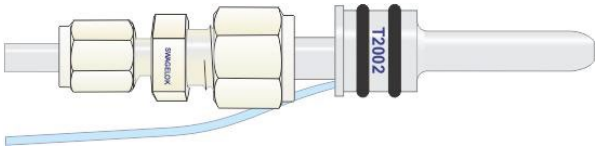
T2002 Manual



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 T2002 nebulizers require 45 - 55 PSI to have a 1 liter per minute of Argon gas flow, so the operating pressures are in the range of 35 - 45 PSI, depending on the torch optimum flow rate.

Minimizing Pulsations: Nebulizers will pulse if the pump cannot 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! 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

1. Washing Your Nebulizer

Please DO NOT wash your nebulizer in acid or solvents to 'prevent salt build up'. Teflon doesn't wet, so Salts do not form. For the best performance & longest life, wash your nebulizer by running water for 10 min. before turning the spectrometer off. Any other form of washing is unnecessary, and often detrimental. Please do not remove the filter in the back of the nebulizer.

2. Optimum Gas Flow Rate & Pressures

Burgener nebulizers will operate safely at pressures up to 80 PSI. Higher pressures produce finer mists, and larger Argon flow rates. For the T2002, on a TJA TRACE approx. 35 - 40 PSI (0.8 l/min) is the normal range. Test it at various pressures to optimize. There may be an optimum rotational direction. After optimizing the gas flow, try rotating the nebulizer in 45 or 90 degree increments to see if you gain in precision.

3. Sample Uptake

Normally, 1 - 2 ml/min seems to work best. For the TJA TRACE use about 2 ml/min for gas flows near 1 l/min. Some systems optimize at less than 1 ml/min. For lower gas flows, higher sample flows are necessary. Rates of 4 or 5 ml/min will not harm the nebulizer, but may drown the torch and may not increase the signal. We recommend orange/orange peristaltic pump tubing with a fast rotating rate rather than larger tubing at a slower rate. Slower rates produce larger surges. For lower pressure settings, an Increase in sample rate may improve %RSD.

4. Humidified Argon

The Burgener nebulizer is 100 % Teflon. Teflon doesn't wet, so salts do not begin to form at the gas orifice. This allows you to run high salts without the tip plugging. It also saves you the nuisance of having to run Humidified Argon to the nebulizer. You may use humidified Argon, but it will not improve the nebulizer's performance.

5. Using Surfactants

Teflon doesn't wet. This causes a slight pulsation in the nebulizer's output, related to the pump's pulsation. DO NOT soak the nebulizer in surfactants to decrease the pulsing. You may succeed, but the surfactant will also allow salts to form at the gas orifice, and plug the orifice. The pulsation is generally well averaged out in the chamber's mixing of the mist as it travels to the torch.

6. Surge Suppressors

Surge Suppressors are not usually necessary. The T2002 produces a reasonably consistent mist even if the pump is surging. The chamber averages out most other pulsations. If you feel that your system needs one, the simplest is simply a large diameter Peristaltic pump tubing (purple/purple) with small pump tubing (orange/orange) stuffed in the ends. This will reduce pulsations considerably.

7. Baffles

Many chambers have baffles designed for nebulizers that extend a shorter length into the chamber. You may have to move the baffle farther into the chamber, or you may require a different style of chamber. A baffle too close to the nebulizer catches fine and coarse mists, and severely degrades the nebulizer's performance.

8. Adjusting your Plasma Height

The Burgener nebulizer will produce excellent mists over a large pressure range. You can adjust the plasma height by varying the nebulizer pressure, with little change in sensitivity due to the nebulizer.

9. Droppage and Breaking

The Burgener nebulizer is 100% Teflon. If you drop it, it may be dented where it hits. If you dent the body of the nebulizer, it will not affect its performance. If the tip is dented, it may destroy the nebulizer. If it works after dropping, it has not been affected, and may be continued to be relied upon.

10. Major Caution

The gas orifice is at the very tip of the nebulizer. Teflon is VERY SOFT. Touching the tip with your finger, a tissue paper, or anything else MAY DESTROY your nebulizer. The only major caution on a Burgener nebulizer is DO NOT TOUCH THE TIP. Having said that, you will accidentally touch the tip sometimes. If it works afterwards, you have done no harm. If the gas orifice is untouched, the nebulizer will not be harmed.

11. Clearing and Replacing the Capillary Tubing

Your Burgener nebulizer is designed with a patented 'Parallel Path' configuration. The largest portion of the sample path to the tip of the nebulizer is at the tip of the nebulizer. It will not plug with dust or sand or other tiny particles. However, the capillary tubing may plug. Generally, the capillary tubing plugs at the joint between the pump tubing and the capillary tubing. To clear such a plug, just cut off 1 mm of the capillary tubing closest to the pump, and use it again. For plugs in the middle of the tubing, or eventually, if the tubing is getting too short, you will have to replace the capillary tubing.

Replacing the Capillary Tubing

Pull out the old capillary tubing. It is just held in place by tension. Take a piece of new tubing, e.g. Polyethylene Tubing, O.D. 1.09 mm (0.043"); I.D. .38 mm (0.015"). Measure out the desired length (About 18 " is our supplied length). Wrap it around your fingers and stretch out about 4 inches to about 1/2 its original diameter. Cut the tubing from the roll at the end of the stretched part. Push the stretched portion through the nebulizer's sample path until it extends out past the end of the nebulizer. Use the stretched portion to pull unstretched tubing past the tip of the nebulizer. Cut off the stretched portion. Pull back the unstretched portion, until the tubing is recessed about .25" from the tip. The distance recessed back is not critical, as long as it is about .25" or more. You are done.