



## General Issues Concerning the P-80/PC

- 1) The Nitrogen tank that comes with the puller is a custom sized tank specifically made for Sutter. It can be filled up to 2,000psi and if it drops below 700psi you can run into variability with cooling. This tank can be filled by a local welding company and sometimes they will require a hydro-tested for a small fee to insure that there are not cracks in the tank.
- 2) Purchasing a new tank from Sutter Instrument Company is an option, but the additional hazardous shipping charges for shipping pressurized gas makes the price unreasonable in most circumstances. Therefore we suggest getting it refilled or renting a large upright tank from a local gas company and setting it up next to the puller. You can order from Sutter additional tubing to connect the tank to the puller if the tubing you have is not long enough.
- 3) There are two regulators on the puller; one for the tank volume and the other is for the outgoing pressure to the puller. This second regulator for the outgoing pressure should be adjusted to 50psi. You might need to go through a few pulling cycles achieve this setting.
- 4) There is a micrometer behind the left puller bar in the vertical position. This is the needle valve adjustment for the amount of nitrogen going from the air solenoid to the gas jet under the filament. This commonly is set between 1 and 1.25. If the needle valve opening is set too low, you will get insufficient cooling and this will result in wispy tips or a pipette with a 1 to 2 micron tube like tip at the end of the pipette. If it is set too high you will get too much cooling which can result in large broken tips.
- 5) The gas jet is located under the filament and is either a bent metal tube found on the older pullers, or a brass block with a hole in it found on not so old P-80/PCs or those which have been upgraded with a "B Kit". In either case the gas jet should be positioned 2-3mm below the base of the filament. Those with the metal tube will be able to adjust it to 2mm below the filament, those with the brass block gas jet have the option of adjusting it 2-3mm below the filament. Make sure that the gas jet is pointing straight up and is not directed off at an angle.
- 6) Check all air tubing connections with soapy water to see if there are any leaks. If a leak is found, loosen the brass connection and wrap some teflon tape around the male connector and reattach. Do not over tighten brass connections since brass is soft and the treads can easily strip.
- 7) Make sure the filament is centered over the gas jet from right to left, and insure that the filament is centered around the glass. To make fine adjustments to the position of the filament use the eccentric adjustments found on the silver colored angle plate behind the right puller bar. Diagram and instructions can be found in the manual or on our web site: [www.sutter.com](http://www.sutter.com), go to "Support" on the left side bar and then go to P-97/P-97 technical pages, then go to "Adjusting Filament Position Using Eccentrics (5MB file)". Although these technical pages addresses both the P-87 and P-97, many of these files will also apply to the P-80/PC. So, please look over this site to see which technical files might address your needs.
- 8) The main difference between the P-87/P-97 and the P-80/PC is the cooling system and the cooling mode on the puller. The P-87 and P-97 use pressurized air created by a compressor that is run through a desiccant, where as the P-80/PC uses a Nitrogen tank. The cooling mode on the P-80/PC is called "Time" and this is the same as "Delay" on the P-97.
- 9) If you need additional information, please call Adair Oesterle at Sutter Instrument Company 415-883-0128 or write to [adair@sutter.com](mailto:adair@sutter.com) or [info@sutter.com](mailto:info@sutter.com).