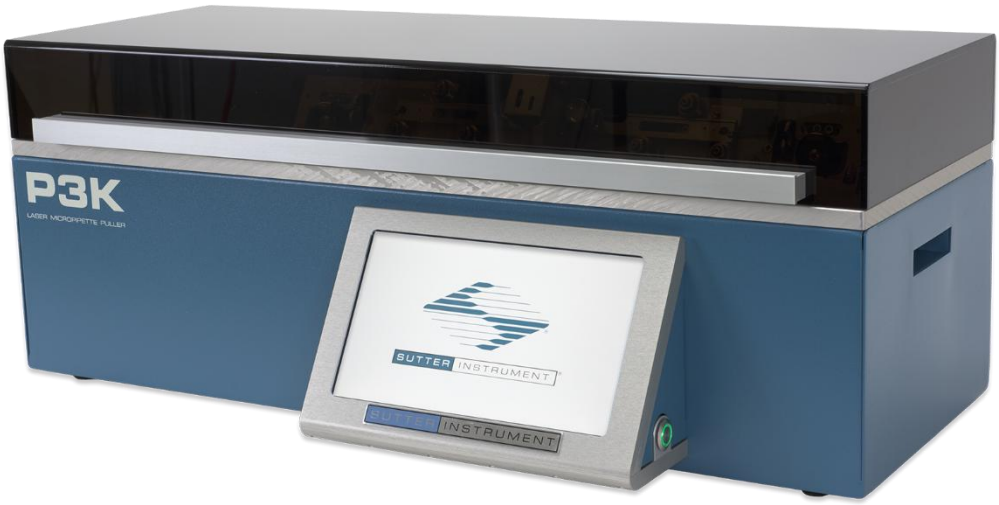


Since the introduction of the P-77 Micropipette puller nearly 50 years ago, Sutter Instrument has been the industry leader in advanced micropipette fabrication technologies. Our newest micropipette puller, The P3K Laser-Based Micropipette Puller, represents the culmination of our knowledge and experience. The P3K is the most versatile micropipette puller ever created, capable of working glass of any composition with a wide range of outer diameters. The P3K leverages the same laser-scanning technology used in our industry standard P-2000 but improves on that legacy design in several important ways.

Bidirectional Laser Scanning

Laser-based pullers can only heat both sides of a capillary by reflecting the incident irradiance not absorbed by the capillary. In both the P-2000 and the P3K, a curved mirror is placed behind the capillary to gather and refocus the excess laser radiation. However, when the laser is only scanned horizontally, as in the P-2000, the amount of excess radiation decreases as the diameter of the glass capillary increases. Because of this, pipettes pulled on the P-2000 will almost always have eccentric tips (i.e. the tip will not sit at the exact center of the pipette's diameter). The larger the diameter of the capillary starting material, the more severe this eccentricity. On the P3K, the laser is scanned both horizontally and vertically. Thus, the user can essentially control the amount of incident laser radiation which does not strike the glass, tuning the amount of reflected radiation to suit pipettes of any starting OD between 0.35 and 2.0 mm. The horizontal scan allows the user to programmatically control the amount of glass mobilized for the formation of a pipette by

SUTTER INSTRUMENT
One Digital Drive, Novato, CA 94949, USA
tel: +1 (415) 883-0128 fax: +1 (415) 883-0572 email: info@sutter.com
www.sutter.com

horizontally scanning the laser along the length of the glass. This allows the user to access a wide range of potential tip geometries without exchanging the heating element, as is necessary in a conventional micropipette puller.

Versatile Puller Bars

In addition to pulling glass capillaries to fabricate micropipettes, the P-2000 has also become the standard instrument for the generation of emitters for nano electrospray ionization in mass spectrometry. These emitters are often fabricated from fused silica HPLC tubing. This tubing most frequently has an outer diameter of just 0.35 mm. On the P-2000, this small diameter tubing necessitated the use of special puller bars and optical tuning. Because of this, it was necessary to have two models of the P-2000 depending on the outer diameter of the glass that would be worked. On the P3K, we have built a nearly universal glass carriage and optical path. Using this system, starting materials having outer diameters between 0.35 and 2.0 mm can be worked without any adjustments being made to the optical path. In principle, larger materials may also be workable, but this has not been tested. One critical caveat is that the puller bars of the P3K *cannot* handle starting materials with outer diameters less than 0.35 mm. Very few materials fall into this range, but it does, importantly, include almost all optical fiber. If a user wishes to use a P3K to work optical fiber, it will still be necessary for that puller to be fitted with special puller bars.

Increased Laser Power

The P3K is a class 1 laser product using an updated CO_2 laser with an available power output of 15 W. With this, the P3K is able to work capillary glass of essentially any chemical composition—with standard options being quartz, fused silica, borosilcate, aluminosilicate, and soda-lime glass.

Advanced User Interface

The P3K utilizes a multi-point capacitive touchscreen to receive user input. This touch panel is exceptionally responsive and can be used for all operations of the puller. The user interface is powered by a single-board computer which has allowed us to implement a very intuitive program storage system. Rather than programs being stored by number, as is the case with all other microprocessor-controlled micropipette pullers, the P3K has a file system that would be familiar to any user of a modern computer. User folders can be created as needed (for instance a folder for a single laboratory, a single experimenter, or a single type of experiment) and any number of individual programs can be stored within each folder. Folders and programs are named at creation using an on-screen QWERTY keyboard. Existing programs can be duplicated within or between user folders. The Instrument comes



preprogrammed with a set of Sutter-developed programs that can be copied into user folders to serve as the basis for user programs. The UI software is also field-upgradable. Periodic updates to the UI will be released to our website and can be loaded into the puller.

SUTTER INSTRUMENT

One Digital Drive, Novato, CA 94949, USA

tel: +1 (415) 883-0128 fax: +1 (415) 883-0572 email: info@sutter.com

www.sutter.com

Features

- 15 W CO_2 laser generates sufficient energy to work glass starting materials of any chemical composition.
- X/Y laser scanning allows for generation of a wide variety of pipette geometries while maintaining tip concentricity.
- Improved pipette carriage and optical systems allow for use of starting materials with outer diameters between 0.35 and 2.0 mm.
- Intuitive and responsive capacitive touchscreen user interface.
- Operating life of the laser is expected to be more than 10 years with regular use, after which the laser can be refurbished by the Sutter Instrument Company for a nominal charge.
- Improved user interface simplifies program development and storage.
- The laser has no melting point limit as with conventional metal filaments; and therefore, cannot be burned out.
- Pulls electrodes with tip diameters smaller than 0.03µm.

Technical Specifications

- Class 1 laser product incorporating an enclosed, embedded, Class 4, 10.6 micron CO_2 laser module.

If you have any further questions, please contact Adam Goldring at Adam@Sutter.com or by calling +1-415-475-4739.

SUTTER INSTRUMENT®
One Digital Drive, Novato, CA 94949, USA
tel: +1 (415) 883-0128 fax: +1 (415) 883-0572 email: info@sutter.com
www.sutter.com