

P-97 FLAMING/BROWN MICROPIPETTE PULLER



The **P-97** Flaming/Brown type micropipette puller is ideal for fabricating micropipettes, patch pipettes and microinjection needles. While retaining many of the features of earlier models, the **P-97** offers improvements in mechanical, electronic and software design. The result is better control of the pulling process and a higher degree of reproducibility. The **P-97** combines a proven mechanical system with a sophisticated, programmable microprocessor controller. This programmable control of the pulling parameters allows the investigator to design application specific pipettes from a wide range of glass compositions and sizes.

A number of other features have been incorporated in the design of the **P-97**.

Most apparent is the environmental chamber which surrounds the heating filament. This environmental chamber is designed to minimize the effect of changing humidity on the reproducibility of pulled pipettes. A 25% increase in power over the **P-87** allows for the use of larger heating filaments, larger diameter glass and multi-barreled glass. The metal jaws that clamp the heating filament have also been redesigned to minimize heat retention. There are two modes of cooling: time and delay. The delay mode provides extended cooling for large diameter and multi-barreled glass. A spring-loaded clamping mechanism has been added for easier loading of glass. A vacuum fluorescent display has been added that allows easy viewing.

Software improvements on the **P-97** include a display of the total heat-on time on to assist in program development and troubleshooting. Up to 100 programs can now be written and stored in memory, which makes the **P-97** suitable for multiple users. These programs can now be write-protected, adding security to prevent programs from being changed or altered inadvertently. The display shows the last date and time the program was written or edited. In addition, the air pressure is a programmable parameter.

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FEATURES > P-97	
Environmental chamber	Internal memory test
Programmable air pressure	Constant current power supply for filament and pull solenoid
Memory storage for up to 100 programs	Looping pull cycle for fabrication of patch type micropipettes
Write protection and date stamp for each program	Self-contained air supply with filtration system and humidity control
Two symmetrical pipettes with each pull	Consistent and reliable electrodes with tip diameters less than 0.1µm
Two cooling modes: time and delay	Control over the time and pressure at which the air is delivered
Preprogrammed sample programs for intracellular and patch pipettes. Special programming on request	Optimized velocity sensing circuit for maximized sensitivity and reproducibility
Ramp test to establish program heat settings when a new filament or glass is introduced	Quality control, SEM photograph of a tip pulled with each puller; criterion is tip measurement less than 0.1µm and typically is ~0.06µm
Vacuum fluorescent display	

SPECIFICATIONS**> P-97****Dimensions**

21in x 16in x 12in
53cm x 40.6cm x 30cm

Weight

50lbs
23kg

Electrical

115/230 Volts
50/60 Hertz power line

**REFERENCES > P-97**

These references describe the Flaming/Brown series of pullers and contain valuable information applicable to the **P-97**.

1. Brown, K.T. and Flaming, D.G. *Neurosciences Journal*: 2:813-827, 1977.
2. Flaming, D.G. and Brown, K.T., *Journal of Neuroscience Methods*: 6:91-102, 1982.
3. Brown, K.T. and Flaming, D.G., *Advanced Micropipette Techniques for Cell Physiology*. John Wiley and Sons. Great Britain, 1986.