



## BV-10 MICROELECTRODE BEVELER



*(BV-10-D with optional 80X stereo microscope)*

### FEATURES BV-10

- Vibration-free, magnetically coupled beveling surface
- Abrasive surface optically flat to a half wave (250nm)
- Finest abrasive surface commercially available
- Synchronous clock motor insures stable rotation rate
- 7 pound steel baseplate adds additional dampening
- Integrated LED lamp
- Robust micromanipulator controls bevel angle and advancement



Elegant and simple to use, the BV-10 offers precision beveling of micropipette tips between 0.1 and 100 $\mu$ m. The unique abrasive plate drive system is vibration free for greater control of the beveling process. Beveling can be accomplished very rapidly and produces consistent tip diameters using the techniques as described by Brown and Flaming, *Science*, August 1974, Vol. 185.

Intracellular recording electrodes can benefit from beveling because of 1) a reduction in the tip diameter by creation of the sharp point on the electrode and 2) a lowered electrical resistance of the electrode due to the larger cross sectional area of the lumen. This greatly facilitates penetrating and holding very small or difficult cells. Microinjection needles also benefit from beveling by promoting entry into cells with minimal damage while at the same time enhancing the flow of material through the needle.

The basic beveling system consists of a stationary pedestal, optically flat to a half wave (250nm), surface mounted on a heavy baseplate. This serves as a bearing for an abrasive coated glass grinding plate, which is also flat to half a wave. The flat abrasive plate is coupled to a low vibration, slow-speed motor by means of magnetic fields to provide a wobble-free flat grinding surface. The abrasive plates are fabricated with a proprietary process which insures a consistent abrasive coating.

A 2-axis micromanipulator holds the pipette to be beveled and permits controlled advancement onto the abrasive surface. The bevel angle and speed of advancement are adjustable. An integrated LED lamp with a gooseneck enhances the beveling operation by providing sharp illumination of the abrasive plate and pipette.

The basic system comes with two abrasive plates of your choice, a wick with holder (for wet beveling), pedestal oil, degreasing fluid, and manual.

Two *options* are available for monitoring the beveling process: an 80X stereo microscope, and an electrode impedance meter. Depending on your research application, one or both of these options may be desirable. For all micropipette applications, the swing mounted microscope enhances your control of pipette advancement onto the abrasive plate and allows for viewing of the beveling operation (scope resolution is not sufficient for viewing the actual bevel except in the case of very large tips). For microelectrode applications, the impedance meter is used to monitor the tip resistance during the beveling operation. The meter is an analog design, offering three resistance ranges (0-10, 0-100, 0-500 M $\Omega$ m). Measurements are made at 12 Hz to minimize capacitive contributions to the impedance measured and provide a near-true DC resistance value. A rapid roll-off is used to reduce 50/60 Hz interference, allowing operation in a laboratory environment without screening.



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## SPECIFICATIONS BV-10

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- **Bevel Range** 0.1 $\mu$ m through 100 $\mu$ m finished electrodes depending on abrasive plate used
- **Grinding Surface Variation** Less than 1.0 $\mu$ m
- **Grinding Speed** 60 RPM
- **Bevel Angle Range** 5-90 degrees - adjustable
- **Micromanipulator** Course drive: 0.075in / dial revolution  
Fine drive: 0.0004in / dial revolution
- **Dimensions Speed** 19in x 9in x 8in  
48cm x 22cm x 20cm
- **Weight** Approx. 45lbs/20kg
- **Electrical** 100/120 or 200/240 volts  
50/60 Hz power line



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### OPTIONS

80X stereo microscope

Impedance meter for real-time measurement of tip impedance



(Shown: BV-10M)



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## BV-10

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- **BV-10-B<sup>1</sup>** Micropipette beveler basic system
- **BV-10-C** BV-10-B with electrode impedance meter
- **BV-10-D** BV-10-B with 80X stereo microscope
- **BV-10-E** BV-10-B with impedance meter and 80X stereomicroscope

<sup>1</sup>Includes micromanipulator, reference wick, reference wick holder, pedestal oil, degreaser, manual, and two abrasive plates of your choice

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## ACCESSORIES BV-10

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- **BV-10M** Electrode impedance meter with active and reference lead
- **BV-10S** 80X stereo microscope
- **104C** Diamond abrasive plate – coarse ( 5.0 $\mu$ m to 50 $\mu$ m tip sizes )
- **104D** Diamond abrasive plate – fine ( 2.0 $\mu$ m to 20 $\mu$ m tip sizes )
- **104E** Diamond abrasive plate – very fine ( 0.7 $\mu$ m to 2.0 $\mu$ m tip sizes)
- **104F** Diamond abrasive plate – extra fine ( 0.2 $\mu$ m to 1.0 $\mu$ m tip sizes)
- **007** Degreaser (bottle)
- **008** Beveler pedestal oil

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## REPLACEMENT PARTS BV-10

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- **101** 6-inch reference lead (body to meter)
- **102** 2-inch active lead (platinum to pipette)
- **X050300** Reference wick
- **M100019** Reference wick holder
- **O664111** Halogen bulb
- **H906100** Drive belt