

## PC-10 Puller

### Vertical pull type with automated double mode for improved versatility

This puller is designed specifically for pulling  $\phi 1 - 1.5$  mm O.D. borosilicate glass capillaries vertically. Two modes are provided: a single pull, which pulls at one stretch, and a double pull in which the setting is changed in mid-process. Therefore the PC-10 can produce long, thin pipettes for injection purposes, and firm electrodes for patch clamping. The change of setting in the double pull mode can be preset and then performed automatically. Digital values of the heater output are shown on the display, making accurate mass production easier.

Accessories included	Glass Capillary with Filament ( $\phi 1$ mm), Spare Heater, Power Cord
Working voltage	AC100 V, 50/60 Hz AC120 V, 50/60 Hz AC220 V, 50/60 Hz AC240 V, 50/60 Hz
Power consumption	Approx. 80 W
Heater level	100 = heater voltage 2.5 V
Weight	Approx. 25 g x 2 Approx. 100 g x 2
Dimensions/Weight	W205 x D190 x H185 mm, 6 kg



## PN-31 Puller

### Horizontal puller for long, thin, or sharp pipettes

This puller uses a pulling method by which  $\phi 1 - 1.2$  mm borosilicate glass capillaries are fine-drawn using electromagnetic force. The long draw-out volume and employment of a strong electromagnetic solenoid enable the production of long, sharp pipettes. The digital display for output of the electromagnet and the heater make it easier to mass-produce large quantities of identical pipettes of uniform quality.

Accessories included	Glass Capillary with Filament ( $\phi 1$ mm), Spare Heater, Heater Reshaping Tool, Power Cord, Hex Wrench
Working voltage	AC100 V, 50/60 Hz AC120 V, 50/60 Hz AC220 V, 50/60 Hz AC240 V, 50/60 Hz
Power consumption	Approx. 250 W
Heater level	100 = heater voltage 1 V
Magnet level	100 = magnetic voltage 35 V
Dimensions/Weight	W300 x D190 x H230 mm, 7.7 kg



## PE-22 Puller

### For special electrodes such as multielectrodes and thick glass tubes

This puller stretches the glass capillary vertically, by using the gravitational force of its own weight and force of the magnet. Capillary sizes ranging from  $\phi 2$  to  $\phi 6$  mm can be used. The PE-22 can produce long, comparatively firm electrodes, or multibarreled electrodes combining three, four and seven  $\phi 1$  mm glass capillaries. Digital display of the magnet and the heater contributes to greater accuracy in mass production.

Accessories included	$\phi 2$ mm Glass Capillaries, $\phi 3$ mm Glass Capillaries, Spare Heater, Electrode Chuck, Power Cord * PE-21HC (for $\phi 3$ mm) is integrated
Working voltage	AC100 V, 50/60 Hz AC120 V, 50/60 Hz AC220 V, 50/60 Hz AC240 V, 50/60 Hz
Power consumption	Approx. 500 W at max.
Heater current	Approx. 17 A
Heater voltage	Approx. 6 V
Dimensions/Weight	W280 x D260 x H600 mm, 20.7 kg



### Consumables for Puller

PC-10		
Model	Description	Configuration
PC-10H	Heater	Kanthal wire (x 5)
GD-1	Glass capillary with filament	Outer diameter $\phi 1$ mm, 500 pcs
GD-1.2	Glass capillary with filament	Outer diameter $\phi 1.2$ mm, 500 pcs
GD-1.5	Glass capillary with filament	Outer diameter $\phi 1.5$ mm, 500 pcs
GDC-1	Glass capillary with filament	Outer diameter $\phi 1$ mm, 200 pcs
GDC-1.2	Glass capillary with filament	Outer diameter $\phi 1.2$ mm, 200 pcs
GDC-1.5	Glass capillary with filament	Outer diameter $\phi 1.5$ mm, 200 pcs
G-1	Glass capillary	Outer diameter $\phi 1$ mm, 500 pcs
G-1.2	Glass capillary	Outer diameter $\phi 1.2$ mm, 500 pcs
G-1.5	Glass capillary	Outer diameter $\phi 1.5$ mm, 500 pcs

PE-22		
Model	Description	Configuration
PE-21HA	Straight heater	Straight wire heater (x 5)
PE-21HB	Coil heater for PE-21, PE-22	For 2 mm glass capillaries (x 5)
PE-21HC	Coil heater for PE-21, PE-22	For 3 mm glass capillaries (x 5)
PE-21HD	Coil heater for PE-21, PE-22	For 6 mm glass capillaries (x 5)
GD-2	Glass capillary with filament	Outer diameter $\phi 2$ mm, 200 pcs
G-2	Glass capillary	Outer diameter $\phi 2$ mm, 200 pcs
G-3	Glass capillary	Outer diameter $\phi 3$ mm, 200 pcs

PN-31		
Model	Description	Configuration
PN-3H	Heater for PN-3, PN-30, PN-31	Platinum board 3 mm (x 3)
PN-30H	Heater for PN-30, PN-31	Platinum board 6 mm (x 3)
GD-1	Glass capillary with filament	Outer diameter $\phi 1$ mm, 500 pcs
GD-1.2	Glass capillary with filament	Outer diameter $\phi 1.2$ mm, 500 pcs
GDC-1	Glass capillary with filament	Outer diameter $\phi 1$ mm, 200 pcs
GDC-1.2	Glass capillary with filament	Outer diameter $\phi 1.2$ mm, 200 pcs
G-1	Glass capillary	Outer diameter $\phi 1$ mm, 500 pcs
G-1.2	Glass capillary	Outer diameter $\phi 1.2$ mm, 500 pcs
GC-1	Glass capillary	Outer diameter $\phi 1$ mm, 200 pcs
GC-1.2	Glass capillary	Outer diameter $\phi 1.2$ mm, 200 pcs
G-100	Thin-walled glass capillary	Outer diameter $\phi 1$ mm, 500 pcs
G-1000	Glass rod	Outer diameter $\phi 1$ mm, 200 pcs

## MF-830

ELECTRO-PHYSIOLOGY



Microforge

### Special puller for fire-polishing of electrodes in patch clamping

This microforge is to specially assist the process by using fire-polishing technology to polish the electrode tips for making good contact between the electrode and the cell membrane in patch clamping. A powerful microscope (525X total magnification) is included for making electrodes with tips less than 2 µm. Independent manipulators are provided for both heater and electrode. A fine movement unit on the side of the heater moves vertically. The heater is turned ON/OFF with a foot switch.

Accessories included	Foot Switch, Dedicated Electrode Holder, Spare Heater, Spare Lamp, Power Cord, Hex Wrench
Movement range	Heater manipulator: X14 mm, Y14 mm, Z14 mm Heater manipulator, vertical fine movement: 20 mm Electrode manipulator: X12 mm, Z28 mm Microscope focus movement range: 30 mm
Magnifications	75X/525X (Eyepiece 15X, Objective lens 5X/35X)
Glass capillary	ø1 – 1.5 mm
Working voltage	AC100 V, 50/60 Hz AC120 V, 50/60 Hz AC220 V, 50/60 Hz AC240 V, 50/60 Hz
Power consumption	Approx. 35 W
Dimensions/Weight	W200 x D350 x H300 mm, 6.5 kg



## MF-900

INJECTION SYSTEMS



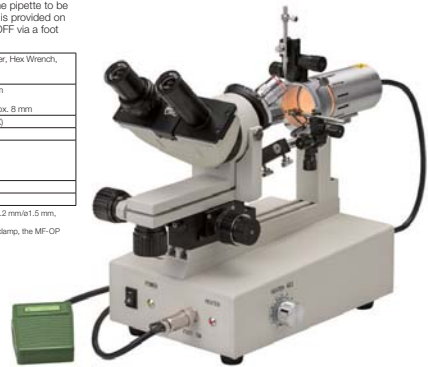
Microforge

### Multiple functions for making different kinds of microtools

The MF-900 microforge offers a wide range of functions such as cutting, bending, fire-polishing, and forming a spike for making many different kinds of microtools by processing pipette tips. Separate rotation mechanisms for vertical and horizontal movement allow the pipette to be approached at any angle. A protractor to measure angles is provided on the microscope eyepiece. The heater can be turned ON/OFF via a foot switch.

Accessories included	Foot Switch, Power Cord, LFN-C Pipette Holder, Hex Wrench, Spare Heater, Spare Lamp, HD1PK01 Silicone Rubber Gasket
Movement range	Heater manipulator: X14 mm, Y14 mm, Z14 mm Pipette manipulator: X12 mm, Z28 mm Microscope: X approx. 7 mm, Y30 mm, Z approx. 8 mm
Magnifications	50X/100X (Eyepiece 10X, Objective lens 5X/10X)
Glass capillary	ø1 mm
Working voltage	AC100 V, 50/60 Hz AC120 V, 50/60 Hz AC220 V, 50/60 Hz AC240 V, 50/60 Hz
Power consumption	Approx. 35 W
Dimensions/Weight	W200 x D350 x H300 mm, 6.1 kg

\* This dedicated pipette holder is for the glass tube ø1 mm. For a glass tube ø1.2 mm/ø1.5 mm, please contact your local NARISHKE representative.  
† If the process of cutting the pipette with a spike or fire-polishing with a patch clamp, the MF-OP optional lens set is required for higher magnification.



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## EG-400

INJECTION SYSTEMS



Microgrinder

### Includes of a microscope for observation of pipette contact at grinding plane

This model provides stable performance from low to high revolution speeds. Confirmation of contact between the pipette and the grinding plane enables grinding to be performed with greater precision. A coarse and fine movement coaxial manipulator is equipped for very precise grinding. A protractor mounted on the pipette holder fixing section makes it easy to set the required grinding angle. An adaptor is attached for vertical grinding.

Accessories included	Adaptor for Vertical Grinding, Diamond Wheel Cleaner, Dedicated Pipette Holder, Hex Wrench, Spare Lamp, Power Cord
Movement range	Up-and-down manipulator: Approx. 47 mm Microscope: X approx. 7 mm, Y30 mm, Z approx. 8 mm
Magnifications	30X Eyepiece 10X, Objective lens 3X
Glass capillary	ø1 – 1.5 mm
Working voltage	AC100 V, 50/60 Hz AC120 V, 50/60 Hz AC220 V, 50/60 Hz AC240 V, 50/60 Hz
Power consumption	Approx. 50 W
Motor speed	Approx. 50 – 2,000 rpm
Dimensions/Weight	W250 x D450 x H400 mm, 6.6 kg



## EG-44

INJECTION SYSTEMS



Microgrinder

### Greater precision with minimal irregular movements on the grinding plane

This model provides stable performance from low to high revolution speeds. A coarse and fine movement coaxial manipulator is equipped for vertical operation of the pipette. A protractor mounted on the pipette holder fixing section makes it easy to set the required grinding angle. An adaptor is attached to prevent clogging or the accumulation of shavings while grinding.

Accessories included	Dedicated Pipette Holder, Adaptor for Vertical Grinding, Diamond Wheel Cleaner, Power Cord, Hex Wrench
Working voltage	AC100 V, 50/60 Hz AC120 V, 50/60 Hz AC220 V, 50/60 Hz AC240 V, 50/60 Hz
Power consumption	Approx. 10 W
Movement range	Up-and-down manipulator: Approx. 47 mm
Motor speed	Approx. 50 – 2,000 rpm
Glass capillary	ø1 – 1.5 mm
Dimensions/Weight	W185 x D165 x H310 mm, 2.4 kg



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