

Harvard Vertical Micro Electrode Pullers



- Economical series of electro-mechanical manually operated vertical pullers
- Two models available:
 - Single barrel for pulling straight single electrodes
 - Multi-barrel for pulling straight or single twisted electrodes
- Controls for selecting heat, pulling force, height

The Harvard series of electro-mechanical operated vertical microelectrode pullers are manually controlled vertical pullers that have been designed to be a cost effective choice for pulling micropipettes. They are available in two models, a single barrel model for pulling single barrel micropipettes or a multi-barrel model capable of pulling 3, 5 or 7-barrel micropipettes. Both systems have an open construction architecture to allow for good visibility of the pulling process.

A Start button on the front panel begins the pulling cycle. The initial pull is by gravity and then a 'user set' solenoid pull completes the process. A damper in the bottom of the puller arrests the lower glass holder gently so as not to damage the lower piece of glass.

There are three variable control functions on each puller: 'Heat' is continuously variable via rotary control, 'Pull' (solenoid force) is continuously variable via rotary

control, and 'Pulling Solenoid Start'. The height of a micro-switch is varied to determine the start of the solenoid pull. On the rear of the cabinet is a wheel which, when turned, raises or lowers the 'Pulling Solenoid Start' micro-switch, thus decreasing or increasing the time before the solenoid is energized. With the micro-switch raised to its highest position, the solenoid becomes energized as soon as the Start button is pressed.

One of the essential factors in the design of a microelectrode puller is the alignment of the glass holders. To ensure that this is as perfect as possible, the moving parts are held in a tower construction of three pillars held by rigid metal plates. A pneumatic damper arrests the puller's chuck during the pull cycle, preventing damage to the lower electrode. The furnace automatically switches off at the end of each cycle.

Single Barrel Puller

The single barrel pipette puller has been designed to pull two identical micropipettes from one piece of capillary glass. It will work with aluminosilicate, borosilicate or other 'low' melting point glass capillary tubing or rod from 1.0 mm to 2.0 mm in diameter up to 6 inches long

The furnace element of this puller is a Nickel Chromium coil 3 mm high, with an internal diameter of 3 mm. This is mounted on one of the pillars with the furnace centered in line

with the top and bottom glass holders. One furnace element is shipped with each unit.

The upper glass holder can be raised to allow a glass capillary to be passed through the heating coil, and then lowered to allow the glass to be secured at each end. The lower holder is raised before securing to the lower end of the glass capillary.

Multibarrel Puller

The multi barrel pipette puller has been designed to pull 2, 3, 5, 7 multibarrel capillary glass. It will work with aluminosilicate, borosilicate or other 'low' melting point glass capillary tubing or rod from 1.0 mm to 2.0 mm in diameter up to 6 inches long

It will not pull 'high' melting point capillary tubing such as quartz. It will also pull the 7 barrel iontophoretic injection micropipette blanks and the P-5 and P-7 multibarrel pipettes.

The furnace element is a piece of 'Omega' shaped, Nickel Chromium ribbon 6 mm deep and 7 mm in diameter. One each of the three furnaces elements (0.25, 0.375 and 0.5 mm) are supplied with each puller. The different thickness offers different heat ratings. The lower glass holder is held in its upper position with a lever while glass is loaded and then can be released to allow the pulling process. The upper glass holder can be rotated through 180 degrees by hand once the glass begins to soften.

Specifications

Single Barrel Puller	22 ga., 71 mm (0.0028 in); Coil 3 mm x 3 mm (D x H) circular coil;
Furnace Elements	Nickel Chromium wire
Multibarrel Puller Furnace Elements	0.25, 0.375 and 0.5 mm (0.01, 0.015 and 0.022 in) thick Nickel Chromium ribbon
Dimensions:	
Base, H x W x D	14 x 25 x 17.5 cm (5.5 x 10 x 7 in)
Overall Height	64 cm (25 in)
Weight	15.9 kg (35 lbs)
Power	90/120 VAC, 60 Hz or 190/240 VAC, 50 Hz

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Power	Single Barrel Straight	Multi-Barrel Twisting
115 VAC, 60 Hz	CGS8250.75	CGS8253.75
230 VAC, 60 Hz	CGS8251.75	CGS8254.75
Replacement Furnace Elements		
3 mm Spiral Wire, pkg. of 3	CGS8252.75	-
0.025 mm Ribbon	-	CGS8255.75
0.0375 mm Ribbon	-	CGS8256.75
0.05 mm Ribbon	-	CGS8257.75
Set of Multibarrel Ribbons	-	CGS8258.75