

Gravipull-2 Micropipette Puller

User Guide

General description

The Gravipull-2 is designed to pull multi-barrel glass micropipette assemblies but it also is capable of pulling single-barrel glass micropipettes. It is intended to soften and pull borosilicate or aluminosilicate glass capillary tubing assemblies ('blanks') up to 0.25" (6.4 mm) in diameter and 6" (152 mm) long. The blank is fixed in the upper and lower chucks of the puller while the upper one is held in place by a locking screw. The 'Start' button on the front panel begins the pulling cycle. The pull is by gravity using an 8-stage weight system. The lower chuck can be rotated once the glass begins to soften. The rotation and pulling cause the lengths of tubing to fuse together. The combination of current supplies to the heating coil and the degree and timing of pull may be varied to produce pipettes of different lengths and diameters. A damper in the bottom of the puller arrests the lower glass holder gently so as not to damage the lower piece of glass. The heater automatically switches off at the end of each cycle.

Specifications

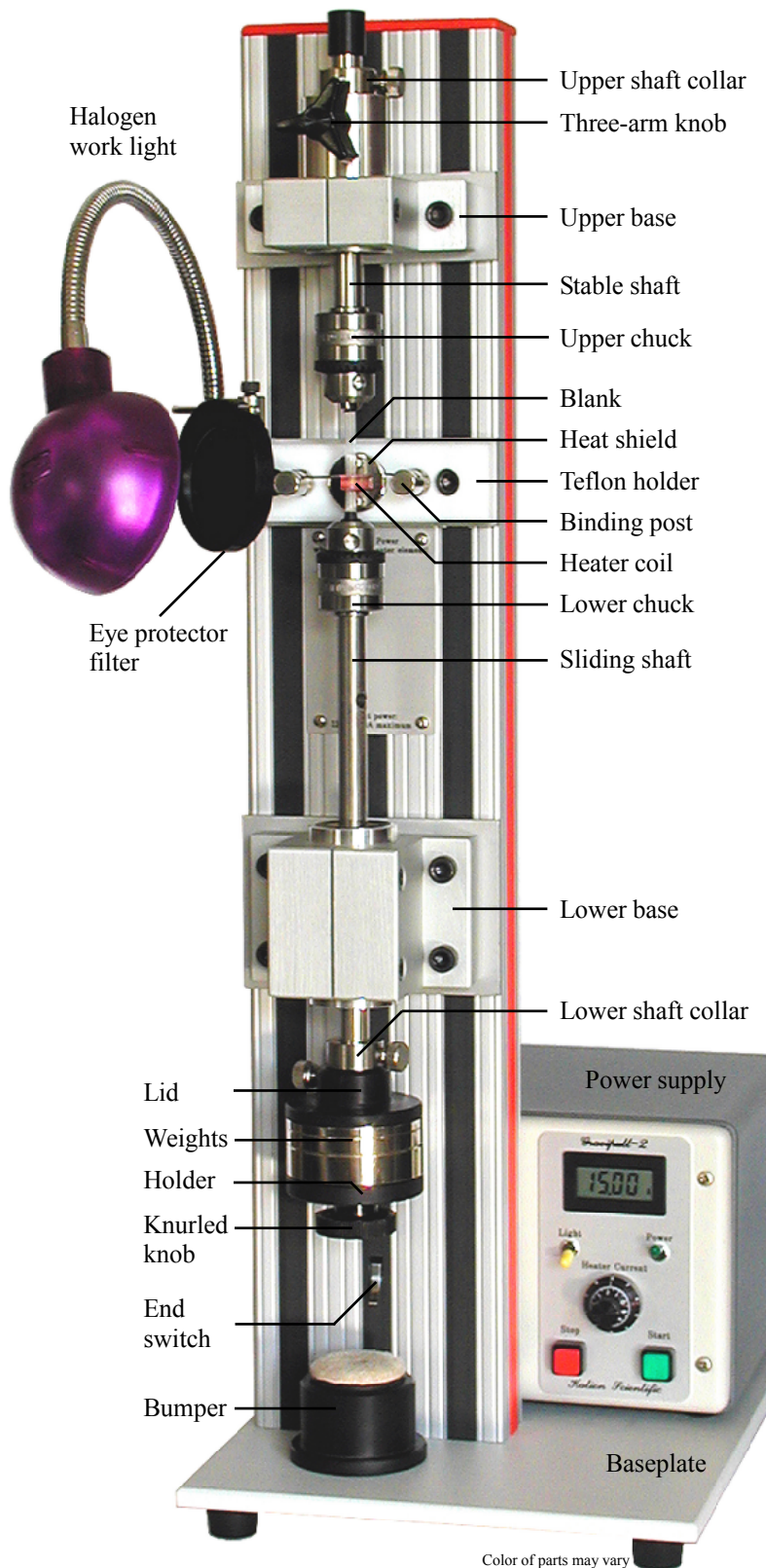
Blank dimension:	0.25" diam. x 6" length max. (6.4 mm x 152 mm)
Slider's travel:	4" (101 mm), vertical
Pulling force:	Gravity-fed set by weight discs
Discs weight:	1 unit, 2 units and 4 units
Weight stages:	0, 1, 2, 3, 4, 5, 6 and 7 units
Heater current:	18 A, max.
Heater voltage:	12 V, DC
Heater wire:	Kanthal AF, 18 GA to 20 GA (0.7 mm to 1.0 mm diameter)
Heater coil res.:	0.6 ohm, min.
Display:	Reflective 4-digit LCD
Work light:	12 V 20 W, type JC halogen bulb
Power source:	115 VAC, 10 A or 230 VAC, 5 A switch selectable
Mains frequency:	From 47 Hz to 63 Hz
Dimensions:	11" x 25" x 13.5" (W x H x D) (28 cm x 63.5 cm x 34 cm)
Weight:	33 lbs (15.0 kg)

Power supply of the Gravipull-2 is approved by FCC Class B, UL, CUL, CB and CE.

Setting up the puller

Unpack your puller with great care. Set up your pulling station in a room with still air having a temperature about 25 °C. Keep in mind that room temperature, humidity and air convection greatly influence the quality of pulling. Place the puller on a horizontal surface.

Locate the orange colored voltage selector on the back panel of the power supply and set it to either 115V or 230V according to your line voltage. The default is 115V (see figure on next page).



Color of parts may vary

Mechanical controls

By means of the upper and lower shaft collars, the position or movement of the respective shafts can be pre-set. This helps to manufacture micropipettes of the same size. The three-arm knob on top locks the upper (stable) shaft in position. Blanks to be pulled are held in the two chucks. Adjust the chucks' grip to securely holding blank without cracking it. Tightening chucks by hand does the job in most cases. Weight discs can be changed after removing the bottom knurled knob and the black weight holder. The black upper lid of the weight assembly should be re-adjusted accordingly using its thumb screw.

Front panel controls

The power regulating circuitry is activated by the 'Power' toggle switch. Work light can be turned on by the 'Light' switch as necessary. The green 'Start' push button switch begins the pulling cycle provided that the sliding shaft is in its upper position and the 'End switch' is deactivated. Current for the heater coil is regulated by the 10-turn 'Heater current' knob. The heater current can be interrupted any time by pressing the red 'Stop' push button switch. The heater automatically switches off at the end of each cycle when the weight assembly returns to its low position and activates the 'End switch.'

Rear panel controls

Before connecting your Gravipull-2 to your wall outlet through the 'Power input' make sure that the necessary voltage is selected by the 'Voltage selector.' The 'Main switch' turns the unit on or off. *Do not obstruct the rear panel cooling fan outlet.*

Making heater coils

Wind Kanthal AF, (from 18 GA to 21 GA) heater wire around a 0.25" diam. (6.4 mm or so) cylindrical object (e.g. a screw bolt) from four to eight times as shown on the right. The horizontal sections of the wire are to be mounted in the spring loaded binding posts of the teflon holder. Position the coil in the posts so that it is coaxial with the pulling shafts. The more the turn in the heater coil the longer the taper of the pipettes will be.

Pulling

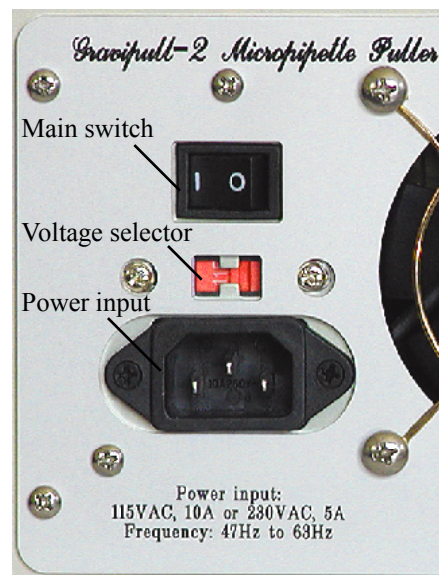
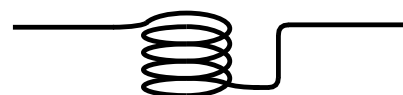
Mount your blank in the chucks with the heater coil in the middle and push the 'Start' button. Gently rotate 1/2 to 3/4 turn the lower chuck when the glass begins to soften. This takes practice! Once the rotation is completed release the chuck and let the slider shaft finish the pull. It is often useful to place the blank upside down in the chucks and use the multi-barrel pipette remained in the lower chuck.

Safety features

For your safety, heat and light from the heater coil can be screened by a darkened glass filter. It can be turned in or out as needed. The heater coil's power supply is short circuit and overheat protected. Turn off power when changing heater coil otherwise a short circuit may occur. If this happens, turn power off for about 30 s then turn it on again. When overheated, the circuit shuts itself down and a beeper sounds. Turn power off in this case and wait about a minute until the unit cools down.

Care and maintenance

Clean your Gravipull-2 using mild detergent only. *Never apply any aggressive organic solvent such as acetone.* The stationary and sliding shafts can only be lubricated with powdered graphite lubricant. Apply graphite lubricant before every major pulling session using a soft cloth. *Never apply any fluid lubricant such as oil or grease.* Keep your instrument in dry conditions away from any moisture or corrosive fumes.



Certification:

Kation Scientific certifies that this instrument has been tested and inspected thoroughly and was found to meet all published specifications before shipment from the factory.

Warranty:

This product is warranted against defects in materials and workmanship for one full year from the date of shipment as long as it has been exposed to normal and proper use. Products which prove to be defective during the warranty period will be repaired or replaced without charge provided they are returned to the factory. Kation Scientific will provide for servicing and calibration after the warranty period for a reasonable service charge. The instrument should be shipped to the factory postage prepaid.

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