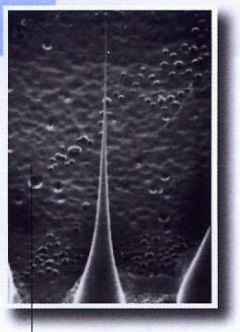
Zeitz

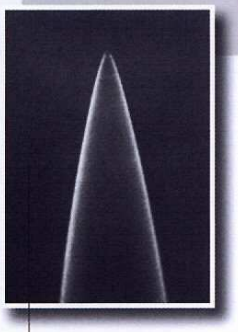
Pull it and use it.

DMZ-ZEITZ-PULLER

You don't need to check the tip size and shape of your microelectrode. Highly reproducible automatic electrode fabrication with the DMZ-UNIVERSAL-PULLER.



Intracellular Electrode



Patch Pipette
opening 0,8 µm

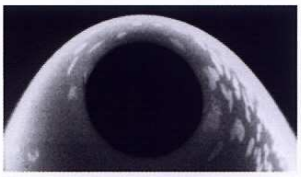
Pipette
27 µm unpolished

Pipette
polished by the puller

PULL IT AND USE IT.
THE DMZ-UNIVERSAL PULLER.

THE DMZ-UNIVERSAL PULLER has the following fully microprocessor-controlled variables:

1. Distance of pull (longitudinal)
2. Pulling force (time-controlled program)
3. Pulling force (distance-controlled program)
4. Time- or distance-controlled heating
5. Heating power radiated by the filament, regulated by optical (ultrared) sensor



Pipette
polished by the puller

The puller features:

- Permanent storage of 80 programs.
- One- or two-stage pulling programs, in which all variables can be set independently for each stage, with the option of repeating the first stage.
- Full automation. There is no risk of breaking even thin-walled capillary glass in the glass holders because the clamping of the glass in the holders is carried out by two micromotors which result in precisely defined clamping forces.
- Choice of capillary glass outer diameter of 1 – 2 mm.
- Symmetrical pipette tips in multi-pull programs (one, two or three preliminary pulls, up to nine preliminary pulls). This is achieved by readjustment of the position of the glass tubing relative to the heating filament after each stage of the pull.
- Free choice and absolute reproducibility of tip diameter (down to 0.1 µm), taper and electrode resistance (up to 100 MΩ).
- Automatic (programmable) control of the duration of heating. This is achieved by automatic positioning (advance or withdrawal) of the „U"-shaped heating filament relative to the glass, thus avoiding the need for air-jet cooling.
- The DMZ-Universal Puller has exceptionally low friction and inertia because of the absence of any rigid connection between the linear pulling motor and the pulling rod.
- Compensation for variations in the wall thickness of the glass tubing. This is achieved by the (programmable) inclusion in the pulling programs of a phase in which the stiffness of the tubing is sensed during pulling.
- Especially suitable for pulling patch electrodes of precisely defined tip o.d. (usually 1 – 80 µm). The puller will also heat polish the electrode tips after pulling.
- The heating filament is made of Kanthal®, a special high-temperature alloy. Although Kanthal is extremely robust and durable, the extremely precise control of filament heat, a prerequisite for the puller's exceptional pipette reproducibility, requires that the filament heating time constant be as low as possible, which in turn requires that the filament mass be as low as possible. Since this limits the lifetime of the filament, it is important that the filament be replaced in good time so as to maintain the pipette reproducibility.
- Electrode tip sizes and shapes are relatively (compared with other pullers) independent of the precise shape and position of the heating filament. Repeated, time-consuming readjustment of the heating filament is thus unnecessary.
- The excellent reproducibility of electrode tip characteristics (even over months) means that electrodes can be made as required, immediately before use. Prefabrication of large numbers of electrodes well in advance of an experimental series is no longer required.

Make your pipette within seconds.

- Single-pull programs
- Multi-pull programs
- Polishing patch electrodes

1. Insert a glass blank into the micromotor controlled glass holders.
2. Press START.
3. After the pipettes have been pulled and the glass holders have reopened, remove the finished pipettes.

Polishing.

You can even polish pipettes: instead of removing the pulled electrodes, press START again. The right-hand holder will immediately move to the right, the heater switches on for the selected heat and heats the tip for the selected time.

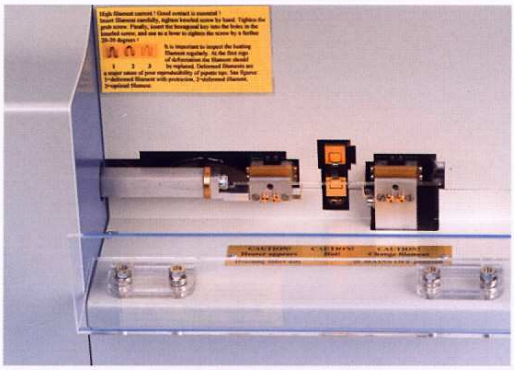
Press START once again. The left-hand electrode moves to the right for the selected distance and is polished.

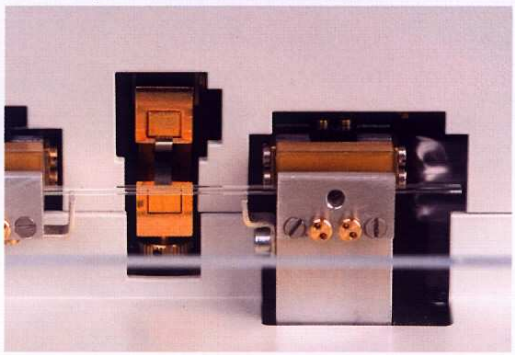
Pre-installed programs.

The puller is delivered with 80 programs where 20 programs are already installed and which are suitable for common electrode glass types (borosilicate, aluminosilicate). The programs can be altered at will.

The parameter values for the 20 programs are listed on a sheet supplied with the puller.

This extremely adaptable puller will eliminate microelectrode fabrication as a factor limiting of your electrophysiological work.





After the pipettes have been pulled and the glass holders have reopened, remove the finished pipettes.

Technical data.

Glass types:	Borosilicate Aluminosilicate
Min. glass length:	75 mm
Min. glass outer diameter:	1.0 mm
Max. glass outer diameter:	2.0 mm
Physical Dimensions:	
Width:	48 cm
Depth:	30 cm
Height:	26 cm
Weight:	28 kg
Warranty:	2 years

Zeitz

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