

EL_{ELECTRO}PORATOR

High-voltage electroporator

Single cell electroporation made easy



Description

The EL_{ELECTRO}PORATOR from npi electronic is a device for electroporation of single cells, e.g. for transfection of DNA.

The EL_{ELECTRO}PORATOR is an analog device that converts any input signal into a proportional output signal. There are two versions of the device, one with a pure voltage output, one with both voltage and current at the output. EL_{ELECTRO}PORATOR -POT and EL_{ELECTRO}PORATOR -CURPOT

Function

The EL_{ELECTRO}PORATOR has a built-in audio monitor, a resistance measuring system, and analog monitor connections for current, voltage and resistance. The electroporation process can be triggered manually, by foot switch or by external trigger signal. The electroporation protocol is defined by the external analog input signal. For this purpose, we offer the combination with the DigiStim, which is a small USB-programmable signal generator. The protocol can be stored on this and the DigiStim is then triggered by the ELECTROPORATOR as soon as the user triggers the electroporation process. Alternatively, any A/D converter or signal generator commonly used in electrophysiology is suitable.



Application

Setup:

The general application is as follows: The ELECTROPORATOR is delivered with a very simple headstage, the pipette is attached here via a BNC pipette holder. The headstage is clamped into a micromanipulator.

Approaching the cell:

The user sets the audio monitor to "RESISTANCE" and moves the pipette into the bath. Then navigates the pipette to the cell under visual supervision. To bring the pipette directly in front of the cell membrane, the user uses the audio signal dependent on the resistance at the pipette tip. At the membrane, the value and thus the sound pitch increases rapidly.

Resistance measurement:

To cover a wide range of electrode resistances and the large difference in resistance between bath, tissue and cell proximity, the resistance measuring circuit has several ranges, if the measuring range is exceeded or undercut, the unit indicates this with "+/-OVER" LEDs and the user switches one range further.

Electroporation

As soon as the pipette is at the cell membrane, the user can trigger the electroporation process via one of the options (manual, foot switch, external signal). The pipette is afterwards withdrawn, and the user moves on to the next cell.

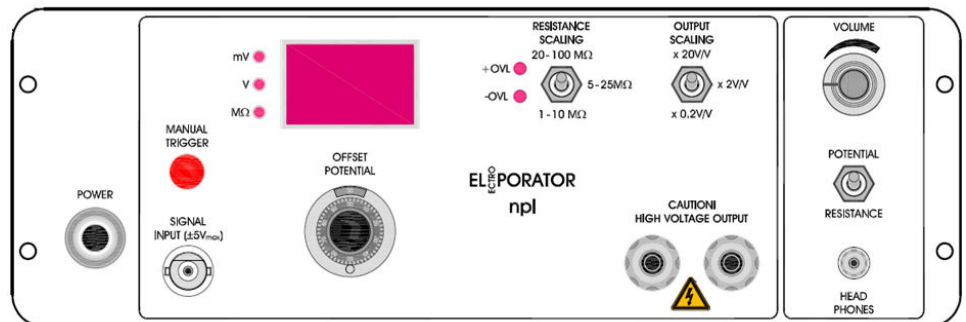


Technical Data

Input signal	$\pm 5V$ max.
Output signal	$\pm 100V$ / $\pm 10mA$ max. scaling 0.2V/V, 2V/V, 20V/V with CURPOT version additionally 0.2 μA /V, 2 μA /V, 20 μA /V, 0.2mA/V, 2mA/V
Monitor signals	Current, potential, resistance
Display:	Display for resistance / voltage / current (CURPOT version) Switches automatically depending on operating mode
Resistance measurement	Voltage based measurement, accuracy 1-2M Ω . Measuring ranges: 1-10M Ω , 5-25M Ω , 20-100M Ω "+/-OVER" LEDs indicate end of measurement range
Audio monitor	Switchable for resistance, voltage or current (CURPOT version) Incl. built-in speaker and headphone jack
Settings for output	Potential offset for CURPOT version: capacitance compensation and current offset

Front panels

ELPORATOR-POT



ELPORATOR-CURPOT

