

The ez-gSEAL 100B

Pressure Controller for Patch Clamping

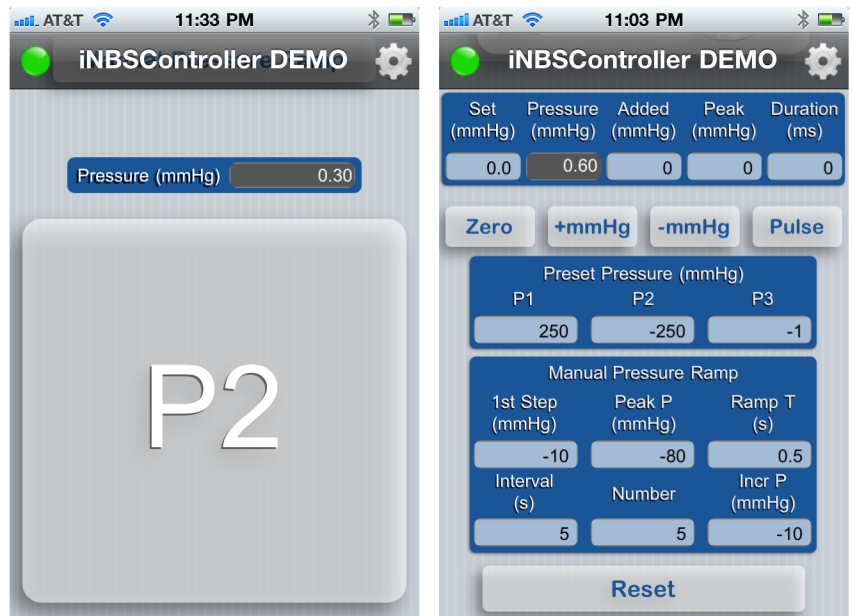
The ez-gSEAL 100B pressure controller is designed mainly for automated patch clamping, but it can also be used for many other applications. With the ez-gSEAL pressure controller, patch clamping becomes as easy as a click of a button. You may use it with our ezPATCH 100A smart manipulator, PatchMAX 100A automated patch clamp system, ChannelMAX 100A Mini automated dual clamp system or ChannelMAX 100A Twin automated quad clamp system for fully automated patch clamp experiments, or use it as a stand-alone product on a traditional rig. You may also use the controller for puffing drugs or studying stretch channels. The software-controlled pressure controller comes with pumps so air tanks are not required.



Precise and User-Friendly Software Control

The ez-gSEAL control software, the NBSController, controls the pressure application and measures the pressure. The pressures that are commonly used can be pre-set so users can click a few buttons to make seals and break-in.

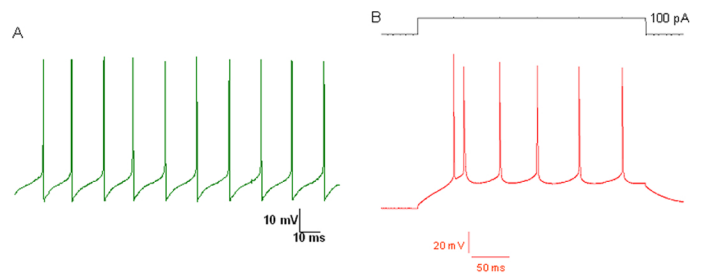
NEW! The ez-gSEAL Pressure Controller can be controlled by iPod Touch, iPhone or iPad. The iPod Touch connects to the server software, the NBSController, through WiFi so you may use the iPod Touch as a remote control to control the device from your rig. The iNBSController is designed so that it can change the values easily. In addition, the pre-saved parameters for making seals and breaking in are played in a sequence so that users can press the button they need without looking.



Applications

Patch Clamp

The ez-gSEAL Pressure Controller has been used by many lab for patch clamping. Example shown on the right is whole-cell current-clamp recordings of neurons in mouse brain slices. A. Spontaneous firing of a cerebellar Purkinje cell. B. Induced firing of a lateral amygdala pyramidal neuron.



Pressure control for stretch channel study

The ez-gSEAL pressure controller can be used for pressure clamping for stretch channel study. The pressure sensitivity is 1.5 mmHg and the pressure range is from -250 mmHg to 250 mmHg. It is suitable for most stretch channels.

Pressure control for drug application

The ez-gSEAL pressure controller can also be used for local drug application. A series of pressure pulses can be given at defined pressures for defined durations.

Technical Specifications:

Pressure range: -254 mmHg to +254 mmHg
 Resolution: ± 1.5 mmHg
 Pressure gauge accuracy: 2.5% of the full scale
 Minimum pulse duration: 7 ms
 Minimum pulse interval: 7 ms
 Tubing OD: 1/8 inch

Dimension: 17"x14"x5.25" rack mount or desk top
 Weight: 10 lbs
 USB cable: Type A Male / Type B Male, 6 ft
 Power supply: 100 V – 240 V input, 12V output.
 Control is via a USB 2 interface.

Making Seal and Breaking-in Parameters

Table 1 Making seal parameters for different cell types.

Cell Type	Positive Pressure (mmHg)	Seal Pressure (mmHg)	Holding Pressure (mmHg)
HEK293 cells	5	-40	-1
DRG neurons (dissociated and cultured)	10	-40	-0.1
Cerebella Purkinje neurons (dissociated)	20	-50	-0.1
Cerebella Purkinje neurons (brain slice)	100	-40	-0.1
Cortical Pyramidal neurons (brain slice)	50	-50	-0.1
Oocytes	5	-20	-1
Drosophila Brain Neurons	40	-40	-0.1
Red Blood Cell	5	-20	-1

Table 2 Breaking-in parameters for different cell types. The required break-in pressure is largely depended on the pipette tip size.

Cell Type	Average Break-in Pressure (mmHg)	Pulse Duration (mmHg)	Holding Pressure (mmHg)	Resistance (MOhm)
HEK293 cells	-110	400	-1	1.5 - 2
DRG neurons (dissociated and cultured)	-80	400	-0.1	3-7
Cerebella Purkinje neurons (dissociated)	-80	400	-0.1	3-7
Cerebella Purkinje neurons (brain slice)	-100	400	-0.1	3-7
Cortical Pyramidal neurons (brain slice)	-100	400	-0.1	3-7
Oocytes	-110	400	-1	1.5 - 2
Red Blood Cell	-110	400	-1	7 - 9