



PLI-100 Pico-Injector



- Repeatability Microinjections
- Integrated Vacuum Generator for Filling and Holding
- Digital Timing Control
- Digital LED Injection Counter
- Digital LCD Pressure Readout
- Balance/Clear Pressures
- Footswitch Controls for Inject, Fill, Hold, and Gated

The PLI-100 is a technologically sophisticated, highly reliable, versatile, 2-channel intra/extracellular injection system. Through a micropipette, it can accurately and repetitively deliver or remove volumes ranging from tens of femtoliters to hundreds of microliters. Delivery of these volumes is both rapid and accurate. Such versatility permits the PLI-100 to be used for a wide range of applications. Large injections into capillaries all the way down to very small injections into mammalian nuclei are all possible.

Unlike other micro-injector systems, the PLI-100 features a built in vacuum generator that provides vacuum for the 'Fill' and 'Hold' functions. The 'Fill' feature allows micropipettes to be loaded from their tip. This technique reduces wastage of small samples or rare injectables. The internally generated vacuum is also used to hold and manipulate cells using a holding pipette. This integrated vacuum system eliminates the need for any external vacuum source.

The PLI-100 also features three positive pressures functions which are used to 1.) Eject precise amounts of fluid. 2.) Create a balance pressure following an ejection and thus preventing any backflow into the micropipette. 3.) Provide a high 'clearing' pressure to remove any fluid or 'clogs' from inside the micropipette.

High quality and the use of high reliability components combined with superior design features, allow the PLI-100 to make accu-

rate and reproducible injections. Unlike other instruments that use inaccurate mechanical dial pressure gauges, and industrial grade components, the PLI-100 provides control of pressure by using precision multi-turn pressure regulators combined with inherently accurate digital electronic pressure monitoring circuits and high visibility backlit digital LCD readouts. Using this technique, pressures can be accurately set and monitored to within 0.1 psi.

Another unique feature of the PLI-100 is the use of a digitally controlled injection timer. Unlike 'analog' timers used in competitive instruments, a 'digital' timer can be set precisely without drift or error. This precision is important to the accuracy and repeatability of the ejection cycle. This timer can be incremented in 10 msec steps in the 0.01 to 0.99-seconds range and 1 second steps in the 1 to 99 seconds range. With exact time and pressure, accurate delivered volume is easily determined.

The PLI-100 is the ideal injectors for a wide range of applications including extracellular brain injections, frog or mouse oocyte nuclear injections, and cytoplasmic mammalian cell injections. Everything from dyes, neurotransmitters, mRNA, DNA, kinases, other proteins, to microbeads may be injected using the PLI-100.

PLI-100 injections can be synchronized by use of an external trigger input or manually through the use of an inject button or footswitch.

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Specifications

Input Gas Pressure	70 to 105 p.s.i. (480 to 720 kPa)
Injection Pressure	0.2 to 60 p.s.i. (413 kPa), regulated, multi-turn control
Balance Pressure	0.1 to 10 p.s.i. (68.9 kPa), regulated, multi-turn control
Fill Vacuum	Internally produced, -12.0 p.s.i. (-82 kPa), unregulated
Holding Vacuum	Internally produced, 0 to -3 in H ₂ O (0 to -0.75 kPa)
Clearing Pressure	Input gas pressure, unregulated
Injection Timer Pulse Width	0.01 to 0.99 sec in 10 msec steps; 1 to 99 sec in 1 sec steps
Injection Count Display	Digital, 0 through 9999
Duration Mode	Internally timed or externally gated
Time Trigger	Front panel, foot switch, or external TTL pulse (BNC)
Pressure Units	p.s.i. / kPa; switch selectable
Pressure Monitor	BNC connector, 10 mV/p.s.i.
Pressure Readout	Inject, balance, clear, output port
Line Voltage	100/110/220/240 VAC; 50/60 Hz
Power	25 VA
Foot Switch(es)	Inject, fill, hold, and gated; provided in plus and deluxe pkg
Weight	6.8 kg (15 lb)
Dimensions	38 x 25.5 x 11 cm (15 x 10 x 5 in)

BALANCE - The Pico-Injector is equipped with a balance pressure. This adjustable control keeps a positive pressure on the injection pipette before and after injections. This eliminates dilution caused by capillary action and aids in the prevention of clogging.

FILL / HOLD - There are two built-in vacuum generators to fill a micropipette from the tip and hold suspended cells. Filling the pipette from the tip is easier than back filling. Suspended cells can be held with a second (holding) pipette. The vacuum's range accommodates most cell types.

CLEARING - A high pressure pulse can be used for clearing a pipette, should it happen to clog. This is particularly useful when working with pipettes sized for smaller volumes.

ELECTRICAL CONNECTORS - BNC type connectors are available at the front panel to ease integrating the Pico-Injector with other equipment. Synchronization of injections to stimulation or recording is thus possible.

OPTIONS AVAILABLE

- Footswitches - for filling, holding, injecting and gating
- 19 inch rackmounts adapters
- Carrying/Inclining handle
- Pipette holders - stainless steel or plastic
- Input hose adapter - for easy connections to gas tanks.

Reliable microinjection requires skill in making micropipettes and using micromanipulators. Equipment for pulling, grinding, polishing, and manipulating pipettes is readily available from **Digitimer Ltd.** We also manufacture temperature controlled micro-incubators for microscope stages.

Contact the **Digitimer Ltd.** technical support staff for assistance in selecting and using your complete micro-injection system. Our application specialists will be pleased to help you.

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A P P A R A T U S



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