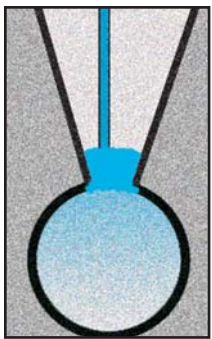
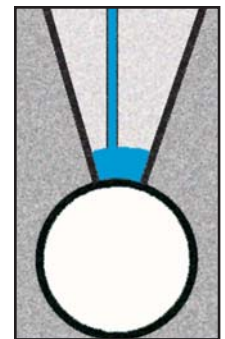
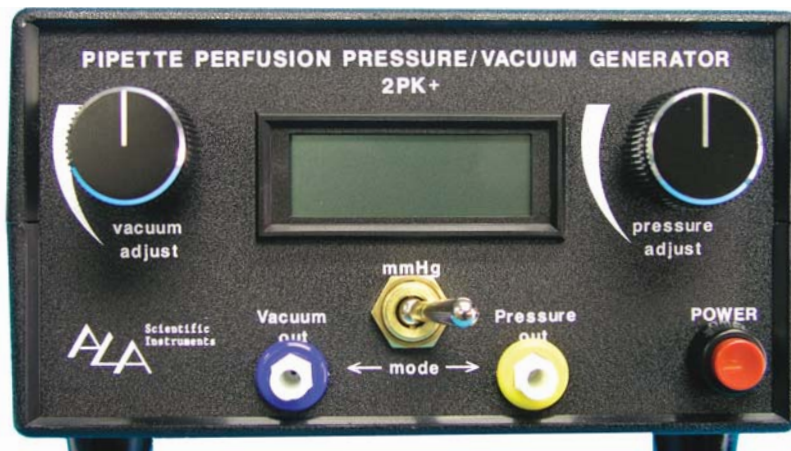


2PK+ Whole-Cell Pipette Perfusion Kit

Access to the cytoplasmic side of the cell during patch-clamp recording is invaluable for second messenger studies and other applications. "Homemade" devices for internal pipette perfusion are cumbersome and unreliable. ALA's 2PK+ is the only commercial kit for internal pipette perfusion. Capable of sensitive and precise vacuum and pressure control of the pipette and designed with a stable mechanism for solution exchange, the 2PK+ is a practical tool for these important applications.



Whole Cell Configuration



Patch Configuration

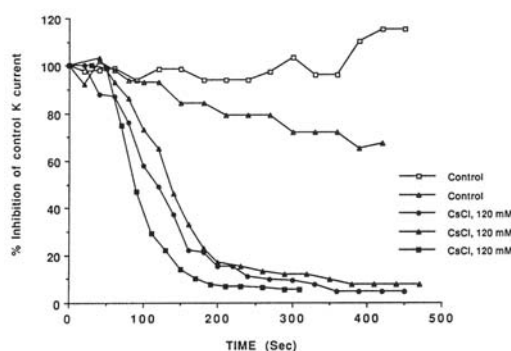
The basic principle of the 2PK+ for whole-cell solution exchange is below:

1. A two-port pipette holder provides separate entry for pressure and vacuum sources.
2. Internal solution exchange is admitted via a flexible capillary that connects to a reservoir and enters the pipette through the side pressure port.
3. The 2PK Pressure/Vacuum Controller allows adjustment of both pressure/vacuum with great sensitivity.
4. Pressure is applied to the pressure vessel which then pushes the solution to be perfused into pipette holder.
5. Vacuum is connected to the standard vacuum port on the pipette holder and is applied during gigaseal formation and during formation of the whole-cell configuration.
6. Solution is driven into the pipette holder and then into the electrode by application of both pressure and vacuum. Forces are balanced to minimize turbulence and likelihood of disruption of the whole-cell configuration.

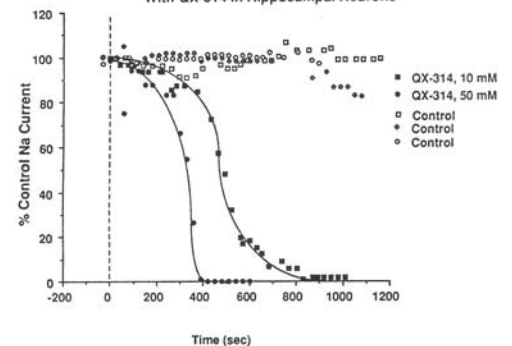
The 2PK+ comes complete with all of the necessary items to make pipette perfusion possible. When ordering please specify amplifier being used and the pipette glass OD size.

Typical 2PK+ Experiment Examples

Inhibition of K Currents By Internal Perfusion of Cs in PC-12 cells



Inhibition of Na Currents By Internal Perfusion With QX-314 in Hippocampal Neurons



Specifications

Dimensions	8" x 7.5" x 3.5" Wt: 2 lbs 6 oz.
Power (regulated)	9V DC / 200mA
Input Pressure	15psi/1bar min. 50psi/3.45bar max.
Output Range	+/- 40 mmHg
Accuracy	+/- 0.2 mmHg

MRC-6 Multi-Reservoir Carousel

The **MRC-6** is an accessory to the **2PK+** kit that makes multiple internal pipette solution exchanges possible.

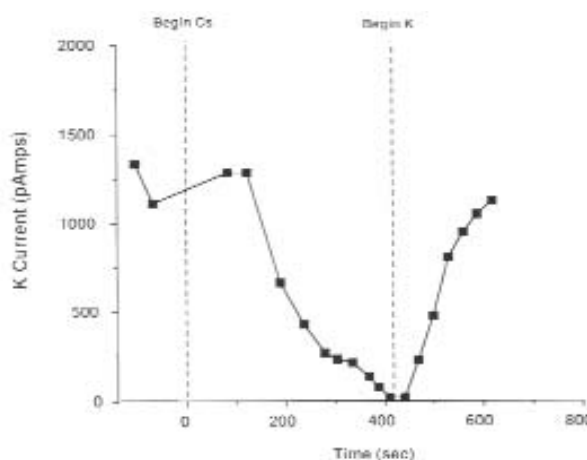
Main Features of **MRC-6**:

- * Holds up to six sample solution reservoirs
- * Exchange solution reservoirs by turning bottom of **MRC-6** to next reservoir
- * Minimizes vibration in the vicinity of the preparation
- * Includes Pt wire for each reservoir to minimize junction potentials



2PK+ with **MRC-6** Experimental Example

Reversible Inhibition of Voltage Dependent K^+ Currents by Internal Perfusion of Cs^+ and K^+ Ions in Cultured Hippocampal Neurons



A sample experiment in which K^+ current is shown to be attenuated by Cs^+ perfusion into the cell using the **2PK+**. The **MRC-6** allows for rapid change over to Cs^+ and then to K^+ to restore the current.

Ordering Details and Accessories

ALA 2PK 30GA	30 Gauge replacement needles - package of 100
ALA 2PK PLUS	Whole Cell/Patch Pipette Perfusion Kit (specify amplifier)
ALA 2PK RES	Set of 3 extra 0.125ml reservoirs
ALA 2PK +PC	Perfusion pressure cell (includes 3 reservoirs)
ALA 2PK +T	Butane torch
ALA 2PK P/V	2PK+ Pressure/Vacuum Generator with output tubing
ALA MRC-6	Multi-Reservoir Carousel (includes 3 reservoirs)
ALA QT-100	Quartz Glass - 20 pieces 100 μ m ID x 4" (other ID's available)
PPH-2P-AXU	Straight Axon Universal Perfusion Holder w/ Ag wire, 2 ports
PPH-2P-BNC	Straight Perfusion Holder w/ Ag wire, 2 ports - BNC type
PPH-OTHERS	Other/Custom Pipette Holders Available

All data obtained using the **2PK+** and the **MRC-6** was kindly provided by M. Dichter - UPENN