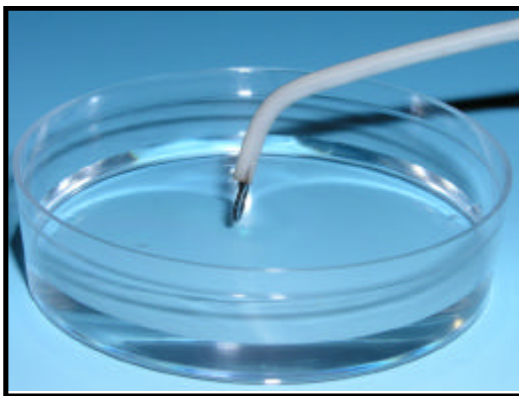


mFluid Chamber Level Controller



Expanded view of the sensor front end. Notice the small size for use with any chamber

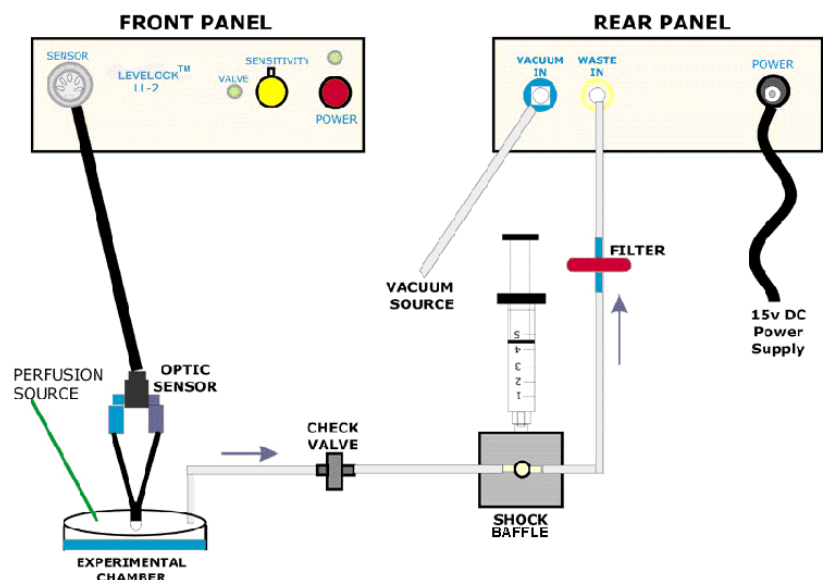
The **Level Lock[®], LL-2**, fluid level controller is a unique instrument for fluid level control. It offers the ability to control the fluid level in a very small chamber (as low as 1ml) with minimal surface disturbance and sub-millimeter accuracy down to 100 μ m. The **LL-2** can handle flow rates up to 8ml/min. We took special care to minimize electrical noise (low noise operation for patch clamp applications) and surface vibrations (to eliminate mechanical artifacts).

The **Level Lock[®]** uses a contact optical sensor to sense the surface of the fluid in the chamber. The sensor is a fiber optic cable with a section of the insulator carefully removed. The fiber is bent 180° at the point at which the fiber is bare. This bend theoretically does not affect the infrared light passing through the fiber. As the bent part of the sensor contacts the surface of the liquid a percentage of the IR light is absorbed by the liquid (by refraction) depending on the depth of the sensor. Thus, the deeper the sensor, the more IR light is absorbed.

This analog signal is translated into valve activity in relation to the surface position. When the fluid surface just touches the sensor, or is below the sensor, the valve is inactive. As soon the fluid height crosses a threshold on the sensor, the valve begins to function. As the fluid advances up the sensor, valve activity increases to an eventual maximum. A suction source (like the **VWK**, see other side) attached to the back of the **Level-Lock[®]** controller box pulls the solution to waste as the valve meters it out.

This is a block diagram of a typical set-up. A perfusion source brings fluid into the experimental chamber. It should have some means of regulating or limiting flow. A steady input will give better results with the **Level-Lock[®]**. There are three main items in the fluid flow pathway to the **Level-Lock[®]**. The first is a check valve, which should be located within inches of the chamber. The next is a shock baffle, that consists of a syringe on a stand. The third item is a filter to protect and prolong the life of the valve in the **Level-Lock[®]**. The shock baffle and filter should be kept close to the **Level-Lock[®]**.

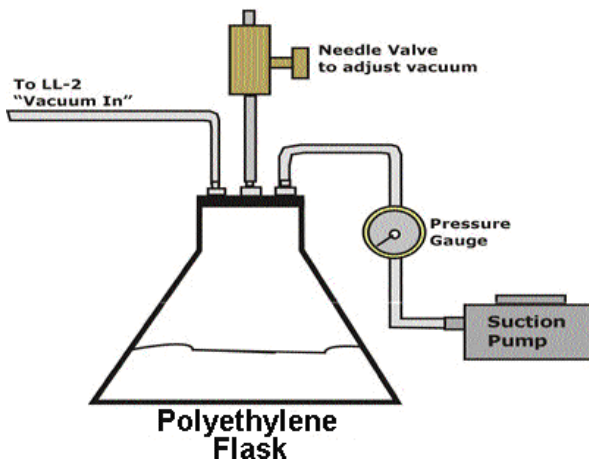
A vacuum source must be connected to the back of the **Level-Lock[®]**. It should have a collection chamber to gather all the effluent for disposal. The vacuum source need not be greater than -0.5 atm. A strong vacuum source should be attenuated with a needle valve to reduce the suction.



An Economical Laboratory Waste System

The vacuum waste kit **VWK** is designed to assist in the removal of fluid from cell preparations. It can provide up to -2.5psi/-17.2kPa suction and trap nearly 2l of fluid. It serves as an ideal suction source for the ALA **Level-Lock** fluid level controller, and is generally ideal for all light duty suction jobs involving small cell chambers. Using the **VWK** in an experiment is very simple. The gauge will read the vacuum pres-

sure in the flask. The needle valve is provided to reduce the amount of suction to your system or cell chamber. The **VWK** comes with a 2l polyethylene flask, vacuum pump, vacuum gauge, needle valve, misc. fittings and tubings, and a plastic stand. The plastic stand keeps all of the parts in a small footprint so it takes up as little room as possible in tight laboratory setups.



block diagram of the VWK



Specifications - LL-2™

Controller Size	13.5x13.5x5.1cm	Flow rate	0-8ml/min with Lee LFAA valve
Weight	350g	Vacuum requirement	-2.5psi/-17.2kPa
Power Requirement	15V 1A	OD of fiber optic sensor	1mm
Nominal length of fiber optic	6in/15cm	IR frequency	950nm (peak)
Sensor cable	1.5m	Sensor material	Lucite/Acrylic

Specifications - VWK

Dimensions	12x10x9" / 30x25.4/23 cm	Weight	3.2kg / 7 lb
Power Requirement	110/220VAC 3.5W	Tubing Diameter	1/16"x1/8" / 1.6mmx3.2mm Tygon
Storage Container	2 liter flask	Max Vacuum	-2.5psi/-17.2kPa

Ordering Details and Accessories

ALA LL-2	LevelLock™ - Chamber Fluid Level Controller
ALA LL-2Filter	20µm waste filter replacement for LevelLock™ - Set of 10
ALA VWK	Vacuum Waste Kit - for use with LevelLock™ or stand alone