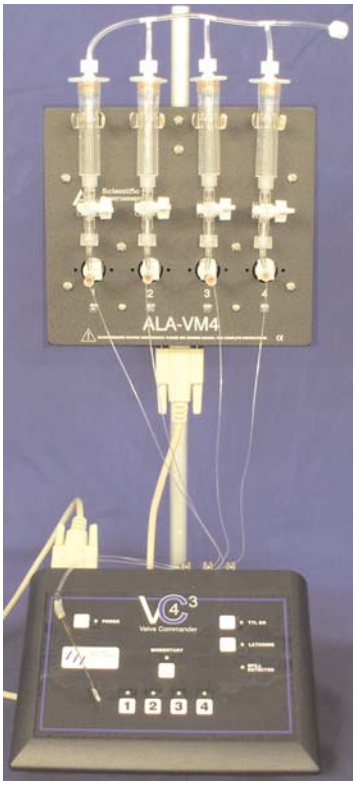
VC³: 4 & 8 Channel Focal Perfusion Systems

Rapid focal perfusion is critical for establishing experimental conditions, such as dose response curves. Electronic control of solution exchange is the only way to ensure rapid fluid delivery and reproducibility. By using a VC³ system with focal outlet, you can configure the system for very basic perfusion requirements or you can optimize the system for the most demanding applications of patch-clamp recording and/or imaging.

VC³ Fast Focal System Highlights

* Easy and fast setup
* 4 & 8 channel versions
* Use with ALA's QMM Micromanifold® for rapid solution exchange and low dead volume (<90ηl)



* Low maintenance pinch valves or fast response solenoid valves
* Electronics suitable for electrophysiology recording

VC³ Controller Features:

VC³ 4 channel controller

* Membrane front panel for touch control
* Automatic valve power reduction to 1/2 value after 50ms
* Manual control: toggle on/off or momentary on/off
* Auxiliary valve control for automatic outlet clearing
* Sync output for valve open marking
* Programmable TTL input or output for even more flexible DAQ control
* Valve Commander software - USB 2.0 for PC control included free with updates available for download via ALA web site

VC³ 8 channel controller

* Lasso Spill Sensor™ to protect expensive microscope parts - audible alarm and automatic shut off when spill is detected
* Computer control: Analog input 0.5V per valve - control system from Pclamp, PatchMaster, and other DAQ systems

VC³ rear panel

ALA Scientific Instruments, Inc.
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VC³: 4 & 8 Channel Focal Perfusion Systems

Choice of valves gives users greater flexibility

Valve Options

3 way pinch

3 way pinch valves with normally open and closed positions. Easy to clean where the normally open port are used for long term perfusion experiments. Response times are 15 to 20ms.

2 way normally closed custom made solenoid valves for high speed 1 to 2ms response times

2 way solenoid

Valve Manifold Options

*** Enclosed in a shielded case for low noise operation**
*** Includes bracket for bar mounting**
*** Comes in 4 or 8 channel configurations**
*** Can hold either pinch or solenoid valves**
*** Single cable connection to VC³ controller**
*** LED indicators for each valve**
*** Comes with 5ml pressurized reservoirs**

All focal systems come with the below items

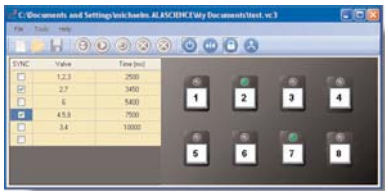
Lasso Spill Sensor™:

Every VC³ system includes one. Just wrap the lasso around your recording/imagining chamber and as little as a drop of solution will cause an automatic shutdown of all valves and an audible alarm.

TTL to BNC cable:

Every VC³ system includes a TTL to 4 or 8 BNC cable. Each BNC is color coded for easy identification. All cables are professionally made.

VC3 Valve Commander Software



Each VC³ system comes with software that allows the user to setup automatic solution exchange. Valve timing, trigger input/output control, sequences, and loops can be programmed. Connection is via the PC's USB port so no internal cards or com ports to worry about.

Pressurized Reservoirs:

Each system comes with 4/8 5ml pressurized reservoirs. Each reservoir includes a 3 way luer stop cock valve for easy connection to other reservoirs for quick filling. Optional sizes include 1ml, 10ml, and 60ml types. Additional cost might apply with these options. Also included is the pressure tubing with each system.

All focal systems include:

-Valve manifold w/5ml luer lock pressurized syringes
-3 way stop cock luer valves for easy filling
-VC³ valve controller with TTL to BNC cable
-Valve manifold with choice of pinch or solenoid valves
-Lasso Spill Sensor™
-Magnetic stand with 1x 18" poles
-Top pressure tubing
-VC³ Valve Commander software

VC³: 4 & 8 Channel Focal Perfusion Systems

Optional Accessories

MLF Millimanifold™:

Millimanfolds™ use polyimide tubing and offer volumes flows larger than QMM Quartz Micromanifold®. The MLF's do not have a removable tip. They include standard barb fittings that connect to 1/16" ID tubing. The MLF's are completely inert, easy to clean, and can be mounted onto any manipulator. They are ideal for focal applications of solutions when applied solution volume isn't critical. Large output diameters (500µm) work well with gravity fed or pressure systems. Standard configurations of 4 to 1, 8 to 1, and 16 to 1 are available. Custom variations are also available.

Compression Fittings:

These fittings are key for connecting small bore teflon tubing to the valves. They come in different sizes to fit different tubing. Some have barbed fitting and some have luer connections.

LL-2, LeveLock™ Chamber Level Controller

Minimizing fluid levels in recording and imaging chambers is critical for reducing stray capacitance and noise, but maintaining low fluid levels with surface aspiration generates turbulent flow and unstable liquid levels. ALA's LeveLock™ LL-2 features a miniaturized, exquisitely sensitive optical sensor that regulates aspiration beneath the air to liquid interface, providing stable and smooth liquid flow at very reduced fluid levels. The LeveLock™ LL-2 is excellent for cellular electrophysiology and imaging applications.

MS-Stage Plate & Tool Holders:

Electrophysiology experiments often require positioning of electrodes and perfusion devices within the confined space of a microscope stage. Utilize the small space efficiently with the MS-Stage Plate and Tool Holders.

Advantages of these tools are:

*Locking ball and socket mount with all tool holders
*Magnetic base anchors holders anywhere on plate
*Durable powder-coated steel construction
*Many different tools for all applications

QMM Micromanifold®:

When you need rapid fluid exchange during focal solution application depend on ALA's QMM Quartz Micromanifold® because of their sturdy construction, inert surfaces, and minimal dead volume.

* Smallest dead volume (<90ηl) available anywhere
* Entire QMM made of flexible, inert polyimide-coated quartz tubing - **NOT JUST THE TIP!**
* Replaceable tips extend useful life of manifold
* Custom configurations available
* Connection to standard microbore tubing via silicone sleeves
* Autoclaveable materials for sterile applications
* Optional holder for manipulators

PR-10 Regulator Option:

The PR-10 is an oxygen safe dual regulator system that completely removes pressure fluctuations at the output. It is used to send pressure for precise, fast, focal drug delivery or for use as the gas bubbler controller. It controls output pressures from 0 to 10 psi. The PR-10 employs a unique pressure switch with two modes for use with fast, focal perfusion. Bleed and pressure modes are used to completely depressurize the pressure reservoirs to prevent in-gassing when not in use. The PR-10 includes a dual scale pressure gauge and luer fittings for the inlet and outlets. Adjusting pressures is easy because the PR-10 sits right next to your microscope, unlike the hard to reach pressure regulators that are directly attached to the pressure source or situated on the holding pole.

VWK, Vacuum Waste Kit:

The VWK is an economical laboratory waste system. It 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 LevelLock™ chamber level controller, and is good for all light duty suction jobs involving small cell chambers.

For further information on any of these system please ask for the literature

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VC³: 4 & 8 Channel Focal Perfusion Systems

Ordering Information

ALA VC³-4PP	4 channel pinch valve focal perfusion system w/pressurized 5ml reservoirs, VC³ controller, power supply, spill sensor, DB9F-BNC4 cable, and software - to miniaturize output use 4 x CF-1 and QMM-4wt or use MLF-4
ALA VC³-4SP	4 channel Lee solenoid valve focal perfusion system w/pressurized 5ml reservoirs, VC³ controller, power supply, spill sensor, DB9F-BNC4 cable, and software - to miniaturize output use 4 x CF-1 and QMM-4wt or use MLF-4
ALA VC³-8PP	8 channel pinch valve focal perfusion system w/pressurized 5ml reservoirs, VC³ controller, power supply, spill sensor, DB9F-BNC8 cable, and software - to miniaturize output use 8 x CF-1 and QMM-8wt or use MLF-8
ALA VC³-8SP	8 channel Lee solenoid valve focal perfusion system w/pressurized 5ml reservoirs, VC³ controller, power supply, spill sensor, DB9F-BNC8 cable, and software - to miniaturize output use 8 x CF-1 and QMM-8wt or use MLF-8

ALA VC³-4C	4 Channel Valve Controller including power supply, DB9-cable	ALA VC³-8C	8 Channel Valve Controller including power supply, DB9-cable
ALA Commander	VC³ valve commander USB software	ALA DB9F-BNC4	TTL trigger to 4 BNC cable for use with VC³
ALA VC³-PS	VC³ controller power supply	ALA DB9F-BNC8	TTL trigger to 8 BNC cable for use with VC³
ALA DB9-CABLE	VC³ controller to valve manifold replacement cable	ALA VC³-BREAK	Breakout board to VC³ controller for up to 8 x 12V valves
ALA QMM-4	Quartz Micromanifold® for VC³-4 systems - to miniaturize the outlet - standard 4 to 1 @ - 100µm ID tubes w/100µm ID tip (custom ID versions available, please call)	ALA QMM-8	Quartz Micromanifold® for VC³-8 systems - to miniaturize the outlet - standard 8 to 1 @ - 100µm ID tubes w/100µm ID tip (custom ID versions available, please call)
ALA QMM-4WT	Quartz Micromanifold® for VC³-4 systems - to miniaturize the outlet - standard 4 to 1 @ - 100µm ID tubes w/100µm ID tip (custom ID versions available, please call) with FEP tubing installed	ALA QMM-8WT	Quartz Micromanifold® for VC³-8 systems - to miniaturize the outlet - standard 8 to 1 @ - 100µm ID tubes w/100µm ID tip (custom ID versions available, please call) with FEP tubing installed
ALA MLF-4	MilliManifold™ 4 to 1 polyimide tubing 500µm ID w/1/16" barb fittings	ALA MLF-8	MilliManifold™ 8 to 1 polyimide tubing 500µm ID w/1/16" barb fittings
ALA PV-2	Flow control manual adjusted pinch valve	ALA SPILSNSR	Replacement Lasso Spill Sensor with connector
ALA VM-STAND	Magnetic base stand for BPS valve manifolds - 2 rods and magnetic base	ALA 60mlRES	60ml pressurized reservoir assembly w/3way luer valve
ALA PV	3 way NC/NO replacement pinch valve	ALA L2V	2-way LFAA Lee Co. replacement valve
ALA VC³4AIR-MAN	VC³-4 Pressurized air manifold tubing set	ALA VC³8AIR-MAN	VC³-8 Pressurized air manifold tubing set
ALA FEP-1	Clear Teflon Tubing - 230µm ID/600µm OD - 4 meters	ALA FEP-2	Clear Teflon Tubing - 380µm ID/760µm OD - 4 meters
ALA 3WLV	3 way stop cock luer valve	ALA SFK	Misc. tube and luer fitting kit
ALA TUBING-4	Silicone pinch valve tubing 2' - pressure flow	ALA PR-10	Adjustable 0-10 psi pressure regulator controller
ALA CF-1	Compression Fitting for PE-10/FEP-1 tubing to 1/16" ID tubing	ALA CF-2	Compression Fitting for PE-20/FEP-2 tubing to 1/16" ID tubing
ALA 5mlRES	5ml pressurized reservoir assembly w/3way luer valve	ALA 10mlRES	10ml pressurized reservoir assembly w/3way luer valve

Specifications

Valve Controller:	
Dimensions/Weight	8"/20.32cm x 6"/15.24cm x 2.5"/6.35cm / 1.5lbs/0.68kg
Power	15VDC/3.15A
Computer Control Input	Analog input 0.5V/valve; TTL high 1 bit/valve; USB 2.0 command
Computer Output Monitoring	Analog output 0.5V/valve; Sync TTL high; TTL high 1 bit/valve
Manual Control	Membrane switch 1/valve; mom on/off or toggle on/off
Valve Manifolds	
Pinch Valves	12VDC/0.25A ea.- 3 way normally open/normally closed pinch valve
Pinch Valve Opening Speed	15 to 20 ms
Pinch Valve ID Tubing	0.020"/0.5mmfor pressurized systems
Solenoid Valves	12VDC/0.08A ea.- Lee OEM Inert Solenoid Valve
Solenoid Valve Opening Speed	1 to 2 ms
Reservoirs	5ml luer lock pressurized syringe w/3way stop cock valve

Sample pressurized flow rate:
1ml in 9 minutes
@ 10 PSI / 70kPa
through QMM with 100µm ID tubes

Specifications are subject to change without notice.