

# Microlab<sup>®</sup> 600 Series

Automated Intelligent Diluting and Dispensing





MICROLAB

6000 Series



Display

Display

Display





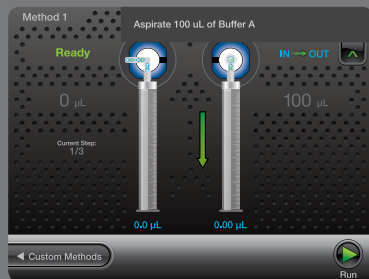
## Custom Program Syringe Pump

See more on [pages 11 & 12](#)



## Basic vs. Advanced Comparison

See more on [pages 15 – 17](#)



## Custom Methods with On Screen Instructions

See more on [page 18](#)

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For more information on the Microlab 600 or to order a product, please visit [www.hamiltoncompany.com/microlab600](http://www.hamiltoncompany.com/microlab600). To place an order by phone, call 888-525-2123 in the U.S. or refer to the back of this catalog for additional contact details.

# Introducing the Microlab<sup>®</sup> 600

The Microlab<sup>®</sup> 600 is a highly precise syringe pump with a touchscreen interface designed to quickly and easily dilute and dispense fluids. This positive displacement system provides better than 99% accuracy, independent of a liquid's viscosity, vapor pressure, and temperature. The inert fluid path minimizes sample carryover and is compatible with harsh chemicals.

## All Labs Can Use the Microlab 600

Every laboratory has tasks too small to automate and too large to reliably accomplish by hand. The Microlab 600 is a semi-automated liquid handler designed specifically for these in-between applications that increase throughput and consistency while reducing cost and wasted buffer. Common industries using the product are:

- Forensics
- Environmental Analysis
- Mining
- Manufacturing



## Benefits of the Microlab 600

The Microlab 600 offers labs a way to securely monitor processes and greatly increase efficiency. No more adjusting pipettes and recalculating dilutions. Quickly recall stored dispenses and dilutions with Favorites. Trigger the hand probe or tap the foot switch to actuate the syringe drives according to a predefined program. These are just some of the conveniences of the Microlab 600. Here are a few more:

- Reduce time preparing samples or dispensing reagents
- Minimize experimental variation from one user to the next
- Manage log files from any PC
- Comply with EPA, FDA GLP and GMP, 21 CFR Part 11, and ISO
- N.I.S.T. traceable calibration



# Dual Syringe Diluters

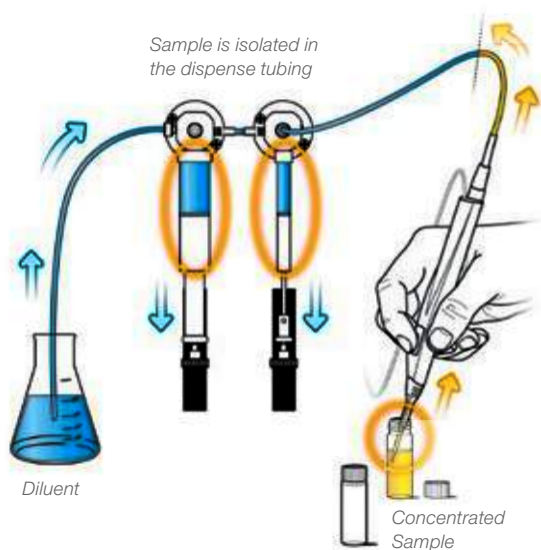
## Concorde Hand Probe

The Dual Syringe Diluter configuration uses two syringes to create up to a 1:50,000 dilution in a single step, drastically reducing preparation time and wasted buffer. The diluent washes the tubing between each sample, minimizing carryover for even the most sensitive techniques including:

- Atomic absorption (AA)
- Inductively coupled plasma spectroscopy (ICP)
- High performance liquid chromatography (HPLC)
- Gas chromatography (GC)
- Liquid scintillation



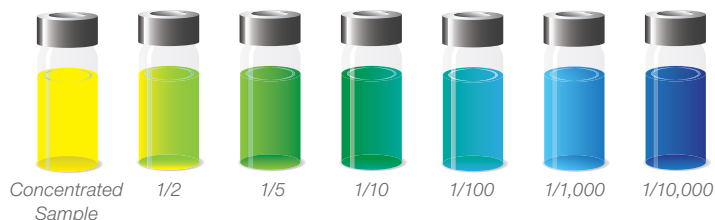
## How Does It Work?



**Step 1.** Program sample and diluent volume.

**Step 2.** Trigger the hand probe to fill left syringe with diluent and aspirate sample into the hand probe with the right syringe.

**Step 3.** Trigger the hand probe to dispense the sample and then the diluent into the vial to complete the dilution and wash the tube for the next sample.



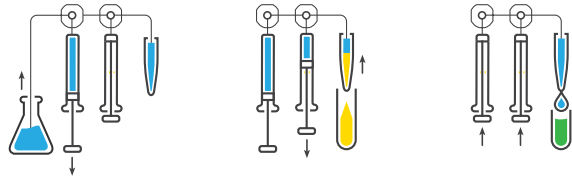


## Dilution Wizard

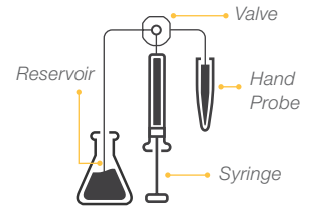
Accurately dilute concentrated samples with diluent over a wide range of dilution ratios.

### Dual Syringe Dilution

- 1 Fill with diluent from the reservoir
- 2 Aspirate sample into the hand probe
- 3 Dispense sample and diluent



#### Icon Key



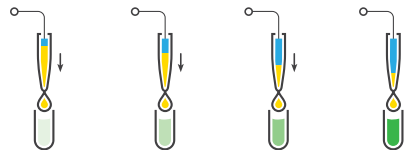
#### Color Guide

- Diluent 1 / System Fluid
- Sample
- Diluted Sample
- Standard
- Diluted Sample + Standard

### Serial Dilution (Programmed)

Repeat the steps for single or dual dilution with varying dilution ratios and the same final volume.

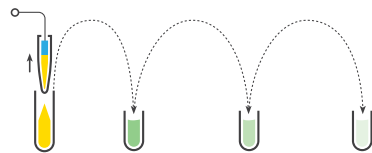
- 1 1/10
- 2 1/25
- 3 1/50
- 4 1/100



### Serial Dilution (Tube to Tube)

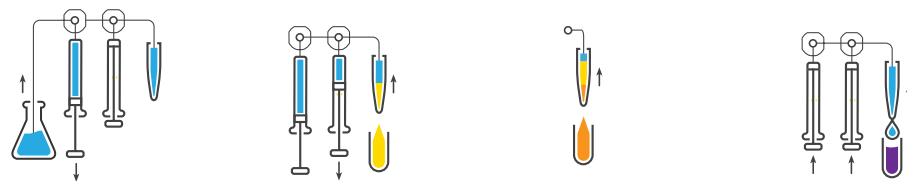
Repeat the steps for single or dual dilution and use the resulting dilution as the sample for the next dilution.

- 1 Sample
- 2 1/10
- 3 1/100
- 4 1/1000



### Multi Sample Dilution (or Internal Standard Addition)

- 1 Fill with diluent from the reservoir
- 2 Aspirate sample into the hand probe
- 3 Aspirate standard into the hand probe
- 4 Dispense standard, sample, and diluent



### Diluter Ordering Information

Part Number	Description
ML615-DIL	Dual Syringe Diluter with Basic Controller
ML625-DIL	Dual Syringe Diluter with Advanced Controller

The -DIL model ships with the Concorde hand probe, universal valves, fill/dispense tubing, accessory holder, country-specific power cord, and the choice of two syringes. If syringes are not selected at the time of the order, 2.5 mL and 250 µL syringes are included.

# Dual Syringe Diluters

## Disposable Tip Hand Probe (DTHP)

For sensitive applications, the sample is aspirated into a disposable plastic tip which is thrown away between each sample, eliminating any chance for carryover.

Applications that benefit from the DTHP include:

- Forensics – for some applications regulatory considerations make disposable tips the preferred option.
- Sterile samples – sterile disposable tips can be used to avoid transferring contamination between sample vessels.
- DNA amplification – for applications where a single amplified strand of DNA is enough to impact results.

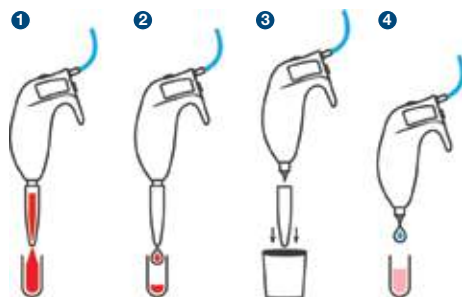






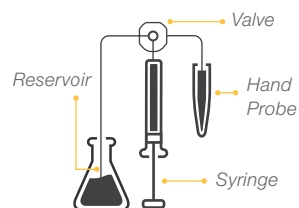
## Dilution Options

### Single Sample Dilution



- 1 The trigger is pressed and the sample is aspirated into the tip using the right syringe while diluent is drawn into the left syringe.
- 2 The trigger is pressed again and the sample is dispensed from the tip.
- 3 The tip is ejected.
- 4 Another trigger dispenses the diluent to complete the dilution.

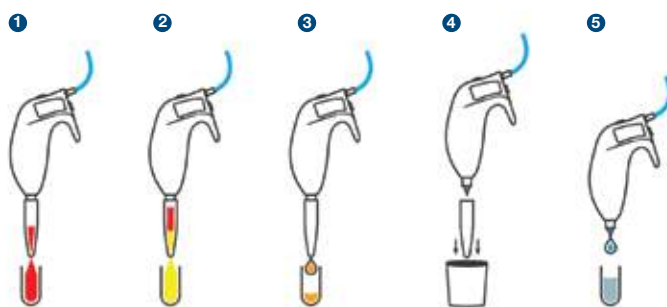
### Icon Key



### Color Guide

- Sample 1
- Sample 2
- Dispensed Samples
- Diluted Sample
- Diluted Samples

### Multi-Sample Dilution



- 1 Aspirate Sample 1 into ClickSure Tip.
- 2 Aspirate Sample 2. Repeat with additional solutions.
- 3 Dispense Samples.
- 4 Discard ClickSure Tip.
- 5 Dispense Diluent.

## Ordering Information

### Disposable Tip Hand Probe

#### Part Number Description

ML625-DTHP Microlab 600 Diluter with Disposable Tip Hand Probe

### ClickSure Tips for DTHP



#### Part Number Description

235537 50 µL, non-sterile ClickSure Tips, 960 tips, racked

235543 50 µL, non-sterile ClickSure Tips, 960 tips, bulk

235536 50 µL, sterile ClickSure Tips, 960 tips, racked

#### Part Number Description

235539 1 mL, non-sterile ClickSure Tips, 960 tips, racked

235545 1 mL, non-sterile ClickSure Tips, 960 tips, bulk

235538 1 mL, sterile ClickSure Tips, 960 tips, racked

The -DTHP model ships with the Disposable Tip Hand Probe, universal valves, fill tubing, Cable Management System, country-specific power cord, and the choice of two syringes. If syringes are not selected at the time of the order, 2.5 mL and 250 µL syringes are included.

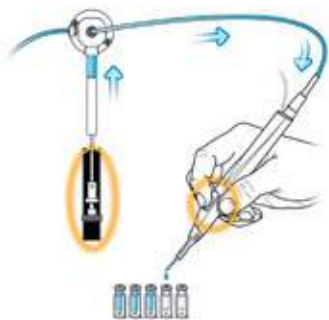
# Dispensers

The Microlab 600 is able to dispense volumes from 100 nL to 50 mL. The Microlab 600 uses positive displacement syringes to accurately dispense volatile, viscous, and dense liquids independent of atmospheric influences. The inert fluid path is compatible with harsh chemicals, making the Microlab 600 the most reliable and robust dispensing system available.



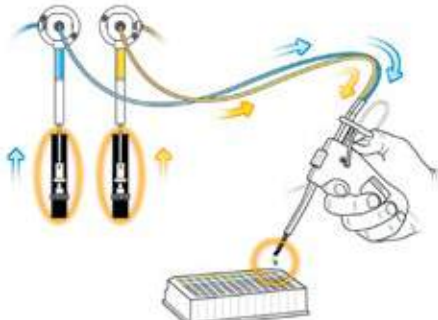
## Single Syringe Dispenser

The syringe fills from a reservoir and dispenses from the hand probe.



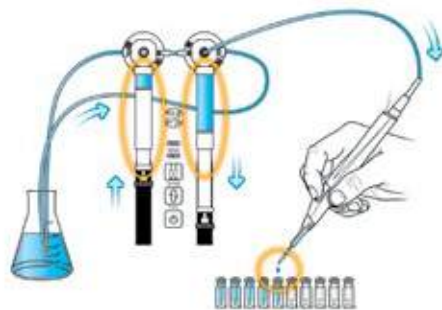
## Dual Syringe Dispenser

Each syringe fills from a separate reservoir and dispenses separately from the hand probe.



## Continuous Dispenser

One syringe fills while the other syringe is dispensing from the same reservoir.





## Aliquot Dispense Wizard

Repetitively dispense aliquots of the same volume at the press of a button.

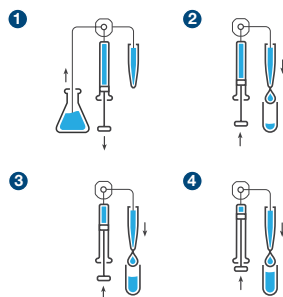


## Serial Dispense Wizard

Repetitively dispense aliquots of differing volumes at the press of a button.

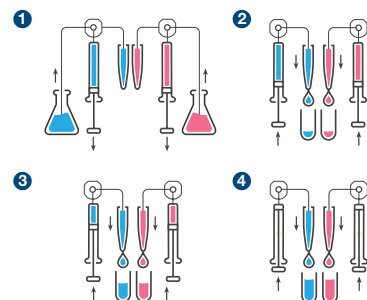
### Single Syringe Aliquot or Serial Dispense

- 1 Fill from reservoir
- 2 Dispense through hand probe
- 3 Dispense
- 4 Dispense



### Dual Syringe Aliquot or Serial Dispense

- 1 Fill from reservoir
- 2 Dispense through hand probe
- 3 Dispense
- 4 Dispense



## Titration Wizard

Slowly add liquid to another liquid until an end-point is reached. An example of this application is adding acid or base to a pH buffer.



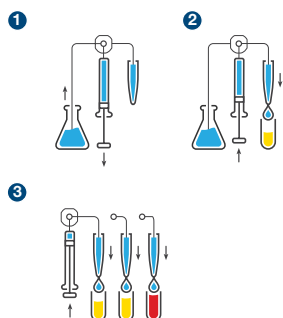
## Pipette Wizard

Simulate a manual pipette used to transfer liquid from one vessel to the next.

### Titration

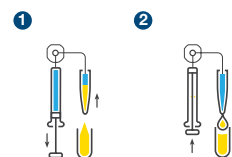
A large initial volume is dispensed to get close to the endpoint. Then a smaller step volume is dispensed until the endpoint is reached.

- 1 Fill from reservoirs
- 2 Dispense the initial volume
- 3 Dispense the step volume



### Pipette

- 1 Aspirate sample into the hand probe
- 2 Dispense sample from the hand probe

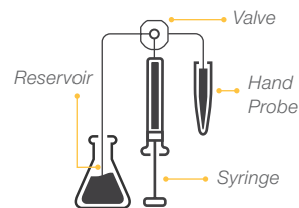


## Dispenser Ordering Information

Part Number	Description
ML610-DIS	Single Syringe Dispenser with Basic Controller
ML620-DIS	Single Syringe Dispenser with Advanced Controller
ML615-DIS	Dual Syringe Dispenser with Basic Controller
ML625-DIS	Dual Syringe Dispenser with Advanced Controller
ML615-CNT	Dual Syringe Continuous Dispenser with Basic Controller
ML625-CNT	Dual Syringe Continuous Dispenser with Advanced Controller

All dispensers ship complete with a Concorde hand probe (the dual -DIS uses the Dual Push Button hand probe), universal valve(s), fill/dispense tubing assembly, accessory holder, country-specific power cord, and the choice of syringes. If no syringe(s) are selected at the time of the order the -DIS will ship with 1 mL syringe(s) and the -CNT will ship with 10 mL syringes.

### Icon Key



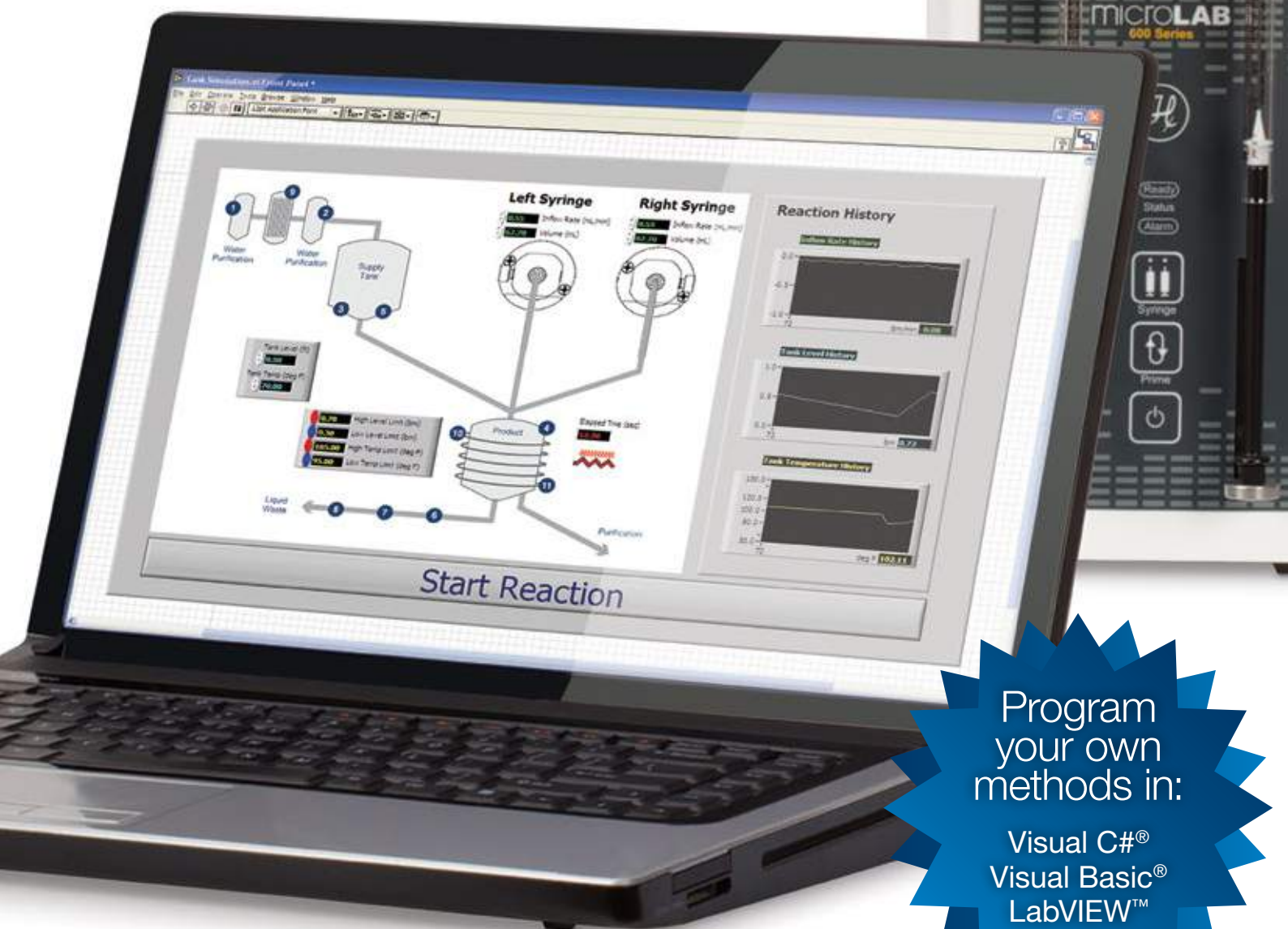
### Color Guide

- Reagent 1 / System Fluid
- Reagent 2
- Sample
- Titration Endpoint

# Standalone Syringe Pumps

## Simple to Integrate

Take full command of your diluting and dispensing applications with the Microlab 600 standalone syringe pump. The standalone syringe pump allows you to custom program methods and deploy commands to any instrument on your network from anywhere in the world, giving you unparalleled control of your process.



Program  
your own  
methods in:

Visual C#<sup>®</sup>  
Visual Basic<sup>®</sup>  
LabVIEW<sup>™</sup>





## Choose Ethernet or RS-232 Communication

### Choose Ethernet Communication If:

- The application requires control over all details of the pump like the front LED lights, acceleration speeds, custom initialization routines, etc.
- Remote control or monitoring of the pump is important. This includes dispensing in restricted environments like clean rooms, rooms with high radioactivity, or chemical contamination, etc.
- Development is being done in a Microsoft .NET 2.0 programming environment. The API simplifies programming with on screen help in an industry standard format.

### Choose RS-232 Communication If:

- The control device is a Programmable Logic Controller.
- The control device is not a PC running Windows® or the programming language is not compatible with Microsoft® .NET 2.0 framework.
- The application has already been implemented using an older RS-232 device like Microlab 500.
- The application requires the use of another Hamilton RS-232 device like Modular Valve Positioner.

### Standalone Pump Ordering Information

Part Number	Description
ML630	Single Syringe Pump
ML635	Dual Syringe Pump

*All standalone pumps ship complete with a universal valve(s), country-specific power cord, Custom Programmer kit, and choice of syringes. If no syringe(s) is/are selected at the time of the order 1 mL syringe(s) will be included automatically.*

# Microlab Hardware

## Controller Features

The Microlab 600 controller features a large, easy-to-use touchscreen with a processor more than 20 times faster than the original controller. A dedicated host USB port enables connection to a keyboard, mouse, printer, and barcode reader.



Back view of Microlab 600 Controller

- 1 Memory Slot
- 2 Optional Power Input
- 3 Host USB for Mouse, Keyboard, Printer, and Barcode Scanner
- 4 Ethernet
- 5 Slave USB Port
- 6 Optional RS-232

## Controller Accessories



2 GB Method Storage



Screen Protector



Keyboard



Mouse



Printer



Barcode Scanner



# Syringe Pump Features

The Microlab 600 is available as a single or dual syringe system. The high torque, precision stepper motors provide unsurpassed positional accuracy across the full range of Hamilton syringes from 10 µL to 50 mL. The instrument communicates with the controller or a corporate network via an Ethernet port. Serial communication via RS-232 is also possible for programming in a non Windows® environment.



- 1 Fanless heat vent
- 2 24 volt power input
- 3 CAN daisy chain input/output
- 4 RS-232 console port
- 5 Power over Ethernet (PoE)
- 6 TTL input/output

## Pump Accessories



AirShield  
(see page 21)



- 1 High torque valve motors
- 2 Precision syringe drives with 48,000 step resolution over 60 mm
- 3 Lighted power and prime buttons
- 4 Independent left and right trigger ports

# Microlab Software

## Choosing a Controller

Hamilton conducted human factor studies to create a clear and understandable system that is communicated through a straightforward user interface. Each screen was thoughtfully designed to simplify the flow of each process and maximize its ease of use.

### Basic Controller

The Basic Microlab 600 controller quickly performs standard dilutions and dispensing using a Quick Start screen.

### Advanced Controller

The Advanced controller contains a significant number of additional features and allows users to create methods using air gaps, washing, repetitive dispensing, and more. For users with the Basic controller that would like to upgrade, it can be easily converted to the Advanced using a simple software kit (P/N 61500-02).

## Basic & Advanced Functionality Comparison

Features	Basic	Advanced
<b>Quick Start Screen</b> – Prime the instrument, program the dispense volume, and start dispensing.	✓	✓
<b>Graphical Pump Status</b> – Animations of the fluid path display the current and future state of the syringe pump.	✓	✓
<b>Adaptive Dispense Control</b> – Adjust dispense volumes in mid-process and the instrument will recalculate the remaining dispenses and proper time to refill.	✓	✓
<b>Configuration Guide</b> – Step-by-step help to set up the instrument.		✓
<b>Wizards</b> – Dedicated Wizards for aliquot dispensing, serial dispensing, dilution, pipetting, and titration.		✓
<b>Favorites Menu</b> – Quickly access frequently used methods.		✓
<b>Custom Method Programming</b> – Create custom applications not covered by a Wizard.		✓
<b>Enhanced Security</b> – Meet 21 CFR Part 11 and FDA GMP/GLP requirements using custom security options.		✓
<b>Method Storage</b> – Create and run more than 1,000 methods on a single controller.		✓
<b>Log File Creation</b> – Create and store files on a memory card, or permanently on a PC using LyncStore™, to meet hardcopy archive requirements.		✓
<b>Language Options</b> – Operate the instrument in 10 languages.		✓
<b>Software Upgrades</b> – Download software updates and receive exciting new features.		✓





# Basic Controller Software

The basic controller is ideal for completing simple diluting and dispensing tasks. Quickly set the desired volume in the Quick Start Run Screen and begin.

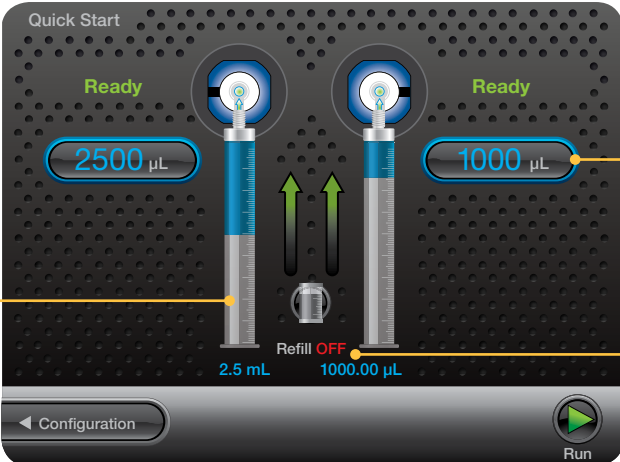
## Simple Diluting

Diluent is drawn by the left syringe and sample is drawn into the tubing by the right syringe. Both syringes dispense to complete the dilution.

## Simple Dispensing

Solvent is drawn into the syringe and dispensed out through the hand probe. With the Basic controller it is not possible to perform multiple dispenses from a single fill syringe.

### Run Screen



The Run Screen displays two syringes. The left syringe has a volume display of 2500  $\mu\text{L}$  and is labeled 'Ready'. The right syringe has a volume display of 1000  $\mu\text{L}$  and is also labeled 'Ready'. Below the syringes, there are two green arrows pointing up, a 'Refill OFF' indicator, and a volume display of 1000.00  $\mu\text{L}$ . At the bottom, there is a 'Configuration' button on the left and a 'Run' button on the right. A '2.5 mL' label is positioned between the syringes.

Graphical status of the current valve and syringe position

Press this button to adjust the dispense volume at any time

Toggle the Auto Refill button ON and OFF

### Configuration Screen



The Configuration Screen features three main menu options: 'Quick Start' (represented by a green person icon), 'Configuration' (represented by a purple gear icon), and 'Utilities' (represented by a red and white wrench icon). The 'microLAB 600 Series' logo is at the top. A 'Run' button is visible at the bottom right.

Press to proceed to the Run screen

Configure valves, syringes, system settings, view firmware revision, etc.

Review system logs and run system updates

# Advanced Controller

## Wizards

Wizards are designed to simplify the programming of common everyday methods. The controller ships with the most popular Wizards installed but it is simple to add or delete Wizards from the menu. Visit [www.hamiltoncompany.com/microlabwizards](http://www.hamiltoncompany.com/microlabwizards) to see a complete list of available Wizards.



### Compliance and Logging

The software provides a variety of security protections, simplifies adherence to FDA GXP regulations, ability to administer user accounts and passwords, create log files that conform to 21 CFR Part 11 and manage log files on a PC using the LyncStore application.



### Language Support

The Microlab 600 features language support for English, Spanish, German, French, Italian, Portuguese, Korean, Japanese, Traditional Chinese and Simplified Chinese.



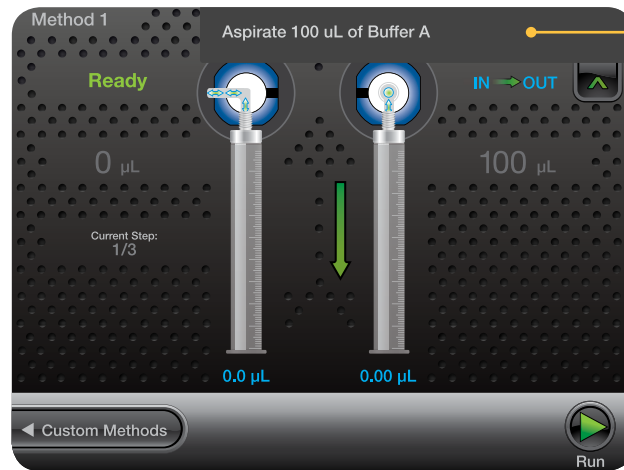
### Archiving and Sharing Methods

Favorites and Custom Methods are stored on the Hardware Key. The card can be used to transfer methods between Microlab 600 Controllers or to a PC for archiving. Methods can also be transferred by e-mail between colleagues.



# Custom Methods

Custom methods can be created to accomplish unique liquid handling tasks. Incorporate loops, delays, external triggering, and execution counters with valve and syringe movements to create complex methods.



On screen instructions tell the user exactly what to do at each step



## LyncStore Software

LyncStore, the new PC-based management system from Hamilton, allows users to easily view, manage, filter, archive, and print log files generated on Advanced Microlab 600 diluters and dispensers. LyncStore meets 21 CFR Part 11 and FDA GMP/GLP requirements making it a valuable addition to regulated labs or labs with increased security protocols.

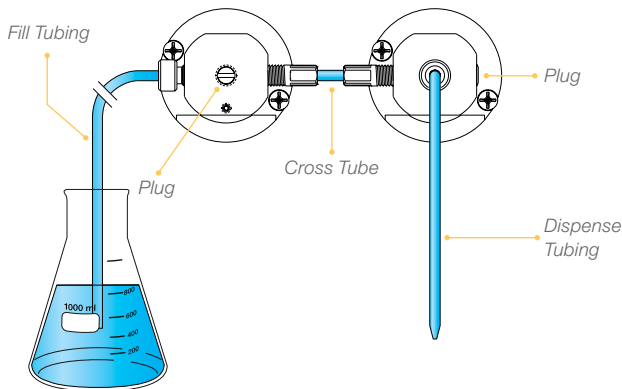
# Universal Valves

Innovative fluid logic allows the same universal valve to be used in all Microlab 600 diluting and dispensing applications. Interchange the valve plugs and tubing to achieve the following configurations in a matter of minutes.

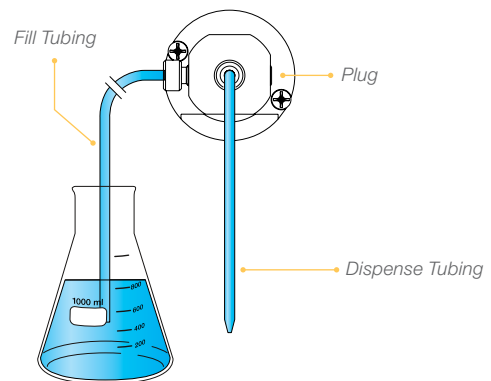


## Valve Plumbing Based on Instrument Configuration

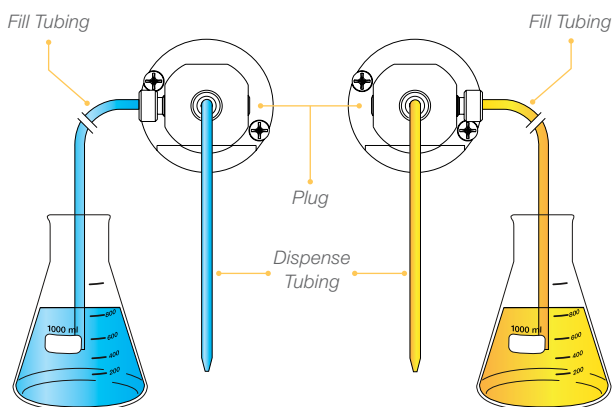
### Dual Syringe Diluter



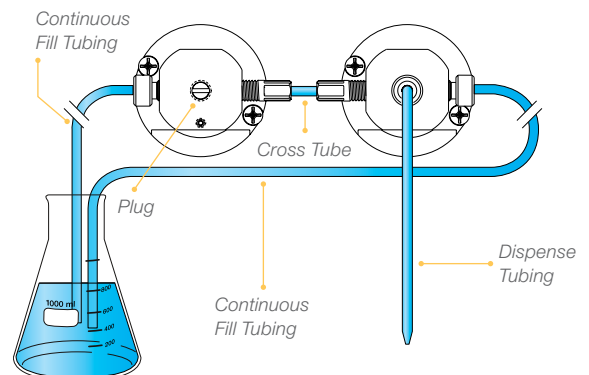
### Single Syringe Dispenser



### Dual Syringe Dispenser



### Continuous Dispenser

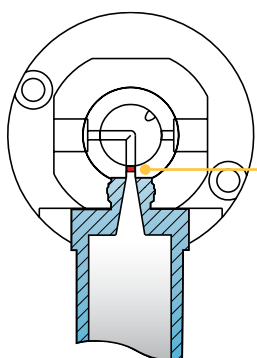


# Bubble Free Prime Syringes

For any syringe pump, the key to achieving the most accurate dispenses is eliminating all air from the fluid path. Traditional syringes trap approximately 50  $\mu\text{L}$  of air between the tip of the syringe and the valve. For small syringes, this trapped air is the last to leave the syringe and the first to be drawn back in, making them difficult if not impossible to prime.

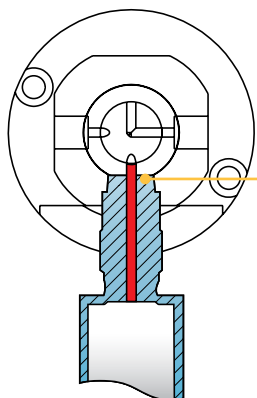
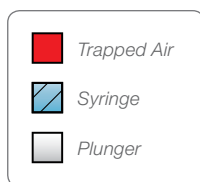
The Bubble Free Prime syringe has a conical plunger tip that extends through the threaded termination and into the valve. This unique design expels the air from the syringe and valve decreasing the number of priming cycles required.

## Bubble Free Prime vs. Standard Syringes



### Bubble Free Prime Syringe

Bubble Free Prime syringes eliminate air from the fluid path



### Standard Syringe

Traditional Luer Lock syringes trap approximately 50  $\mu\text{L}$  of air, making small syringes nearly impossible to prime

Patented conical tip extends through the threaded termination and into the valve



# Accessories

## Protect Your Investment with AirShield



The AirShield is a separate accessory that can be purchased for any Microlab 600 instrument. It creates a positive pressure blanket of fresh air inside the pump that pushes air out over critical components on the outside of the pump, protecting them from the environment.



### Localized Harsh Environment

In many labs the air is relatively clean but samples and reagents placed near the instrument result in a localized environment that can be harmful. For these labs, it is sufficient to source clean air from the back of the instrument away from the microenvironment.



### Optional Snorkel for Fresh Air Supply

For labs with a more demanding atmosphere it is possible to source clean air via a snorkel that connects directly to the AirShield. Fresh air is then brought from outside the harmful environment to create a shield of clean air around all critical instrument components.



# Hand Probes, Foot Switch and Printer Kit

## Concorde CT Hand Probe

(Standard with the Single Syringe Dispenser, Dual Syringe Diluter, and Continuous Dispenser)



**Luer Lock Conversion Kit**  
(P/N 58381-01)

## Disposable Tip Hand Probe

(0.5 - 1000  $\mu$ L)



## Dual Push Button Hand Probe

(Standard with the Dual Syringe Dispenser)



## Large Volume Disposable Tip Hand Probe

(1 - 5 mL)



## Foot Switch



## Printer



## AirShield, Hand Probes, Foot Switch and Printer Kit

Part Number	Description
61401-01	Concorde CT Hand Probe
62541-01	Dual Push Button Hand Probe
63960-02	Disposable Tip Hand Probe (0.5 – 1000 $\mu$ L)*
62575-01	Large Volume Disposable Tip Hand Probe (1 – 5 mL)
75702	5 mL Disposable Tips (250/pk)
62576-01	Foot Switch
68562-01	AirShield
93009-01	AirShield Tubing (includes tubing clamp)
61500-04	Microlab Printer

\* Tips for this probe can be found on page 8.

# Replacement Parts

## Syringes and Power Supplies

### Standard Syringes

Part Number	Syringe Size	Optimal Range
59000-05	10 µL	1 – 10 µL
59000-10	25 µL	2.5 – 25 µL
59000-15	50 µL	5 – 50 µL
59000-20	100 µL	10 – 100 µL
59000-25	250 µL	25 – 250 µL
59000-30	500 µL	50 – 500 µL
59000-35	1.0 mL	100 µL – 1.0 mL
59000-40	2.5 mL	250 µL – 2.5 mL
59000-45	5.0 mL	500 µL – 5.0 mL
59000-50	10.0 mL	1 – 10.0 mL
59000-55	25.0 mL	2.5 – 25.0 mL
59000-60	50.0 mL	5 – 50.0 mL

### SaltLine Syringes

Part Number	Syringe Size	Optimal Range
208335	1 mL	100 µL – 1.0 mL
208336	5 mL	500 µL – 5.0 mL
208337	10 mL	1 – 10.0 mL

### Power Supply & Power Cords

Part Number	Description
61092-01	Power Supply Universal (110–220 VAC)

Part Number	Description	Diagram of Plug
355008	Switzerland	
3892-01	Continental Europe, Russia, Schuko	
3892-02	Australia, New Zealand, Argentina, China	
3892-03	UK, Ireland, Malaysia, Middle East	
3892-05	USA, Canada, Mexico, Central America, Brazil, Japan	

### Selecting a Syringe:

Select the smallest syringe with a maximum volume that is greater than the largest volume to be dispensed. Ideally the smallest volume to be dispensed should fall within the optimal ranges listed to the left. The Microlab 600 can dispense volumes below the optimal range but there will be some impact on accuracy and precision. The SaltLine Syringes should be used when working with solutions that have a high salt concentration. Contact a Hamilton sales representative for additional assistance.

Power Cord



Power Supply





# Valves, Tubing, Upgrade Kits and Miscellaneous Accessories

## Universal Valves & Accessories

Part Number	Valve Assembly Description
60676-01	Left Valve Assembly
60675-01	Right Valve Assembly
61498-01	Valve Cross Tube Assembly
61729-01	Valve Plug (1/pk)



Left Valve



Right Valve



Valve Plugs



Cross Tube

## PTFE Tubing Assemblies

Part Number	Gauge	Type	Length	Internal Volume
61615-01	18	Fill Tubing	48" (1219 mm)	0.96 mL
240134	18	Dispense Tubing	54" (1372 mm)	1.08 mL
1174-02	18	Fill Tubing	Custom Length	0.79 $\mu$ L/mm
1173-02	18	Dispense Tubing	Custom Length	0.79 $\mu$ L/mm
61614-01	12	Fill Tubing	48" (1219 mm)	3.83 mL
240133	12	Dispense Tubing	54" (1372 mm)	4.31 mL
1172-02	12	Fill Tubing	Custom Length	3.14 $\mu$ L/mm
1171-02	12	Dispense Tubing	Custom Length	3.14 $\mu$ L/mm
61491-02	18	Continuous Fill Tubing		0.79 $\mu$ L/mm
61491-01	12	Continuous Fill Tubing		3.14 $\mu$ L/mm



Fill & Dispense Tubing

(Dispense tubing has tapered end)

## Upgrade Kit

Part Number	Upgrade Kit	Includes
61500-02	Basic to Advanced Controller Upgrade Kit	Advanced manual, 2 GB SD card, SD to USB converter, and programmer software CD
61500-03	Custom Programmer Kit (Compatible with Microsoft® .NET 2.0 and higher)	Programmer software CD with manual, Application Programming Interface, and example LabVIEW™, Visual C#® and Visual Basic® programs



Software CD & SD Card

## Misc. Accessories

Part Number	Description
88990	Tubing Clips (5/pk)
61710-01	Accessory Holder & Tubing Wire Stand
65160-01	Cable Management System



Accessory Holder & Wire Stand



Tubing Clips

# Specifications

## Controller Specifications

<b>Screen size</b>	5.7 inch (15 cm diagonal)
<b>Screen resolution</b>	640(W) x 480(H) pixels
<b>Tilt positions</b>	5 positions from 90° to flat
<b>Mounting options</b>	On top of the syringe pump, bench top, or wall mount
<b>Program memory</b>	2 GB (with Advanced upgrade)
<b>Communication type</b>	Ethernet, 10/100 BASE-T
<b>Power rating</b>	24 VDC, 2.5 A
<b>Dimensions</b>	2.29 x 6.5 x 7 inch (57.2 x 165.1 x 177.8 mm) in down position
<b>Weight</b>	1.9 lbs (0.86 kg)

## Single and Dual Syringe Pump Specifications

<b>Accuracy</b>	+/- 1%
<b>Precision</b>	+/- 0.2%
<b>Syringe drive mechanism</b>	1.8° stepper motor with variable volumetric flow rate
<b>Flow rate</b>	0.003 – 6000 µL/second (depending on the syringe that is selected)
<b>Syringe resolution</b>	0.002% of the nominal syringe volume
<b>Compatible syringes</b>	10, 25, 50, 100, 250, 500 µL, 1, 2.5, 5, 10, 25 and 50 mL BFP Syringes
<b>Volume range</b>	1.0 µL – 50 mL
<b>Fluid path</b>	Borosilicate, PTFE, CTFE
<b>Communication type</b>	Ethernet, 10/100 BASE-T
<b>Communication protocol</b>	.NET 2.0 Application Programming Interface (API)
<b>Pump memory</b>	One method stored in non volatile memory
<b>Calibration</b>	Factory tested and traceable to N.I.S.T. standards
<b>Certifications</b>	CE, CSA
<b>Power requirements</b>	100 – 240 V 1.5 A max 50/60 Hz
<b>Power rating</b>	24 VDC, 2.5 A
<b>Dimensions</b>	7 x 5.5 x 10.5 inch (177.8 x 139.7 x 266.7 mm)
<b>Weight</b>	13 lbs (5.9 kg)



# About Hamilton

## The Measure of Excellence®

Hamilton Company specializes in the development, manufacturing, and customization of precision measurement devices, automated liquid handling workstations, and sample management systems.

Hamilton's processes are optimized for quality and flexibility. Whether it's a custom needle with a quick delivery timeframe, a special length pH sensor, or a comprehensive solution to fully automate your assay workflow, trust that Hamilton's products will always meet your needs.

### OUR COMPLETE PORTFOLIO



#### Laboratory Products

Hamilton Laboratory Products manufactures Microliter™ and Gastight® syringes that set the standard for analytical fluid measurement. Other products include custom needles, semi-automated diluters and dispensers, polymeric HPLC columns, pH electrodes, pipettes, and more.



#### Process Analytics

Hamilton Process Analytics includes innovative solutions for the online measurement of pH, dissolved oxygen, conductivity, ORP, viable cell density, and total cell density. Hamilton's proprietary Arc® intelligent sensor technology eliminates the need for transmitters and moves the functionality to your smartphone or tablet.



#### Robotics

Hamilton Robotics provides automated liquid handling workstations and laboratory automation technology for the scientific community. With a focus on innovative design, our products incorporate Hamilton's patented liquid handling technologies for fully automated solutions. In addition to liquid handling platforms, we also offer application-specific solutions, small devices, and consumables.



#### OEM Solutions

Many of the world's top manufacturers utilize Hamilton products and expertise to get their innovations to market faster with lower development and manufacturing costs. As an OEM partner, we offer the ability to integrate our proven syringe pumps or pipetting channels, customize our proven liquid handling platforms or design a complete system to automate your novel chemistry.



#### Storage

Hamilton Storage offers ultra-low temperature automated sample management systems for storage of a variety of labware. Hamilton's line of biobanking and compound management systems, benchtop devices, and consumables are designed for sample integrity, flexibility, and reliability.

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Hamilton Company has been a leading global manufacturer for more than 60 years, with headquarters in Reno, Nevada; Franklin, Massachusetts; Timișoara, Romania; and Bonaduz, Switzerland; and subsidiary offices throughout the world.



Your Hamilton Representative

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