Diluters and Dispensers

Sample preparation made easier!

Certified Quality Management System
SQS
ISO 9001 (Rev. 1994)
EN 46001 (Rev. 1993)
REG Nr. 10644-03

HAMILTON
the measure of excellence

HAMILTON´s diluters and dispensers.

All chemical analysis starts with sample preparation. Laborious, repetitive and error prone, these time-consuming yet critical tasks must be performed accurately with each new sample.

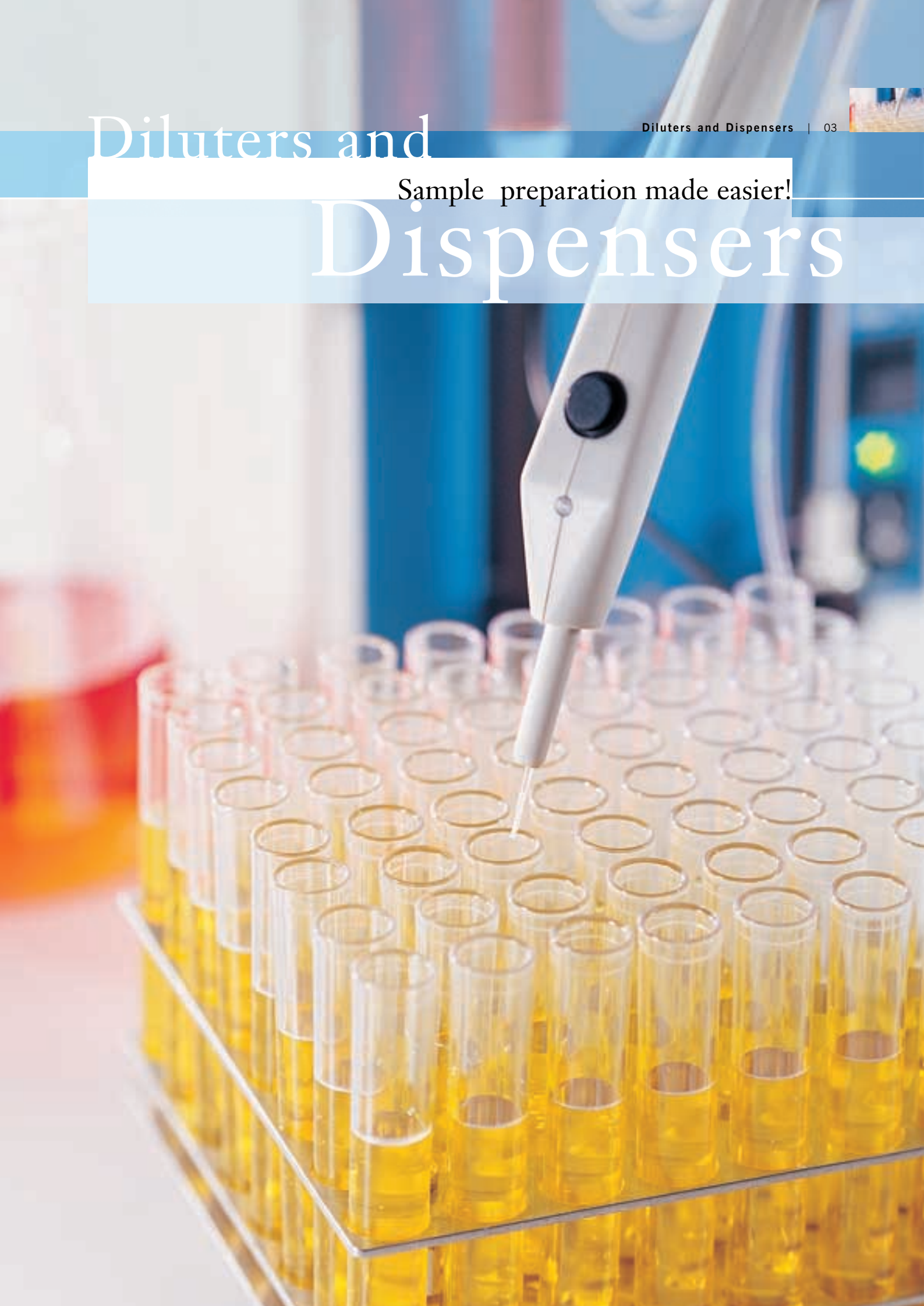
HAMILTON semi-automatic diluters and dispensers can replace volumetric glassware for sample dilutions, saving time while reducing waste disposal costs and nearly eliminating user errors. Sample preparation becomes easier for many types of applications, including HPLC, Gas Chromatography, Atomic Absorption Spectroscopy, and Solid Phase Extraction, to name just a few.

With more than 40 years of experience, HAMILTON is renowned as a worldwide leader in liquid handling. The well-established, reliable, high-tech products conform to CE requirements and are the result of continuous, innovative development work. Thus, our highly-motivated staff and a well-established Quality System (certified according to ISO 9001) are the basis of our constant success.

Sample preparation becomes easier for many types of applications.

Diluters and Dispensers

Sample preparation made easier!



Microlab® 500 Instruments Diluters and Dispensers

- Save time during sample preparation with semi-automated, precision fluid measuring
- Eliminate technician-to-technician method variability
- Simplify compliance to method documentation requirements for regulations and standards, such as those of the EPA, FDA (GLP, GMP), and ISO
- Achieve certified accuracy and precision better than 99% traceable to N.I.S.T.
- Choose from multi-language display screens and manuals (English, French, German, Portuguese, Spanish)

Microlab® 500 diluters and dispensers are precision fluid measuring instruments based on HAMILTON's world-renowned syringe technology. The semi-automated instruments use positive displacement to achieve highly accurate and precise fluid aspirations and dispenses. A simple touch-of-a-hand probe button or a tap-of-a-foot switch actuates the precision syringe drives to fill or dispense a desired volume of fluid.

Microlab® 500 Series

The Microlab® 500 series of diluters and dispensers are available in four basic models:

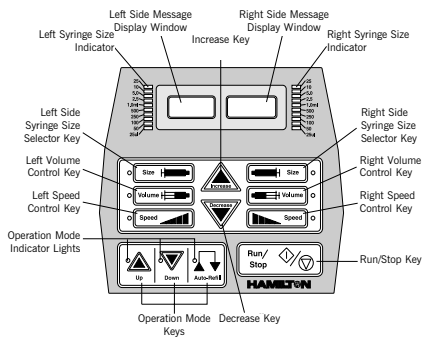
1. ML500A Series: single-program memory instruments
2. ML500B Series: 21-program memory instruments
3. ML500BP Series: 21-program memory instruments with print function
4. ML500C Series: PC-controlled instruments

Microlab® 500A Series Instruments

The Microlab® 500A series is an inexpensive line of instruments which meet the needs of any laboratory demanding an accurate diluter or dispenser. The instruments accurately and precisely aspirate and dispense fluid at the touch-of-a-hand probe button or the tap-of-a-foot switch.

The Microlab® 500A series is easy to program and modify. The programmed method is retained as long as there is power to the instrument.

MICROLAB 500A Controller Keypad



Instrument Feature	ML500A Series	ML500B Series	ML500BP Series	ML500C Series
Program memory	Single program	21 programs	21 programs	1 program stored in EEPROM
Print function	No	No	Yes	No
Working volume range	1 µL to 25,000 µL	1 µL to 25,000 µL	1 µL to 25,000 µL	1 µL to 25,000 µL
Syringe speed	2 to 20 seconds	1 to 250 seconds	1 to 250 seconds	1 to 250 seconds

Microlab® 500B Series Instruments

The Microlab® 500B series is a versatile, easily-programmed line of instruments ideal for laboratories performing multiple dilute and dispense methods. The user can program and store up to 21 methods in the instrument's memory.

The easy-to-use LCD menu allows the naming of programs using alphanumeric characters. Programmed methods are retained in memory after the power is disconnected.

Microlab® 500BP Series Instruments

Microlab® 500BP series instruments perform the same functions as the ML500B series. In addition, the ML500BP incorporates a print function to provide for the documentation of results in compliance with regulatory authorities, such as the EPA, FDA (GLP, GMP), and ISO.

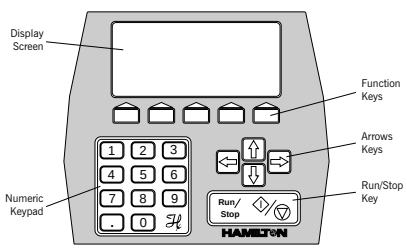
Three selectable print options are available:

1. Print method names
2. Print a stored method from memory
3. Print a method as it is run

Microlab® 500C Series Instruments

The Microlab® 500C instruments perform the same functions as the 500B series except that programming and method storage is performed using an computer and RS232C communication. The computer controls the Microlab® 500C instrument based on the method selected or one that has been preprogrammed into the instrument's EEPROM (Electronically Erasable Programm-able Read-Only Memory). Up to 16 instruments can be daisy-chained and controlled from the host computer.

Microlab 500B/BP Controller Keypad



Microlab® 500B/BP Controller	
Method Types	Program Options
• Dilution-simple, serial, multisample/ reagent or internal standard addition • Dispenses-aliquot, serial, simple • Pipette • Titrade	• Air gaps • Syringe speed • Wash commands • Automated aspirate, dispense and fill commands • Return to reservoir • Time delays

Microlab® 500 Diluters

- Save time during sample preparation
- Eliminate technician-to-technician method variability
- Simplify compliance to method documentation requirements for regulations and standards, such as those of the EPA, FDA (GLP, GMP), and ISO
- Reduce solvent consumption and sample volume requirements
- Reduce waste disposal costs
- Achieve certified accuracy within ± 1.0% and
- precision within + 0.2%, traceable to N.I.S.T.

Microlab® 500 diluters simplify the preparation of sample and standard dilutions. Common dilutions for concentrated out-of-range samples, such as 1/4, 1/10, 1/25, 1/50, 1/100, and greater can be prepared in half the time as compared to manual methods using volumetric flasks.

Plus, due to the accuracy and precision possible with HAMILTON syringes, dilutions can be made in small quantities to reduce solvent consumption and waste disposal costs, and to reduce the amount of sample or standard required. For example, sample and standard dilutions for analytical techniques, such as AA/ICP, GC, and HPLC, can be prepared directly into autosampler vials with final volumes as small as 1000 µL. See Figure 1.

Dilution	Solvent Volume (Diluent)	Sample Volume	Final Volume (Diluted Sample)
1/4	750 µL	250 µL	1000 µL
1/10	900 µL	100 µL	1000 µL
1/25	960 µL	40 µL	1000 µL
1/50	980 µL	20 µL	1000 µL
1/100	990 µL	10 µL	1000 µL
1/250	996 µL	4 µL	1000 µL
1/500	998 µL	2 µL	1000 µL
1/1000	999 µL	1 µL	1000 µL

Figure 1: Dilutions with final volumes of 1000 µL made directly into autosampler vials

Ordering informations

Single Program Memory, Microlab® 500A Series

Model	Part #	Description
ML 503 A	RML503115	Dual Syringe Diluter, 115VAC
ML 503 A	RML503220	Dual Syringe Diluter, 220VAC

Microlab® 500B Series

21 Program Memory, Microlab® 500 Series

Model	Part #	Description
ML 530 B	RML530115	Dual Syringe Diluter, 115VAC
ML 530 B	RML530220	Dual Syringe Diluter, 220VAC

Microlab® 500BP

Model	Part #	Description
ML 532 BP	RML532115	Dual Syringe Diluter with print funktion* , 115VAC
ML 532 BP	RML532220	Dual Syringe Diluter with print funktion* , 220VAC

* includes printer and printer paper

PC Controlled,
Microlab® 500C Series

Model	Part #	Description
ML 531 C	RML531115	Dual Syringe Diluter without controller, 115VAC
ML 531 C	RML531220	Dual Syringe Diluter without controller, 220VAC

Note: Microlab® 500C Diluters are intended for industrial filling and OEM applications. Optional cabling includes: part # R35824, DB-9 to RJ-11 communication cable, and part # R35833, RJ-11 to RJ-11 daisy chain cable. A PC (Personal Computer) is not supplied.

How a Diluter Works

Simple dilutions can be made in three easy steps (after priming the instrument), as shown in Figure 1:

Step 1: Fill the left syringe with the programmed amount of solvent (diluent) from the reservoir.

Step 2: Aspirate the programmed amount of concentrated sample into the end of the probe using the right syringe.

Step 3: Dispense the sample and solvent into a vial to complete the dilution.

In addition to simple dilutions performed on all Microlab® 500 diluters, models ML530B, ML532BP and ML531C instruments can also perform serial, and multi-sample/ reagent (or internal standard addition) dilutions. See Figure 2.

Figure 1: A simple dilution

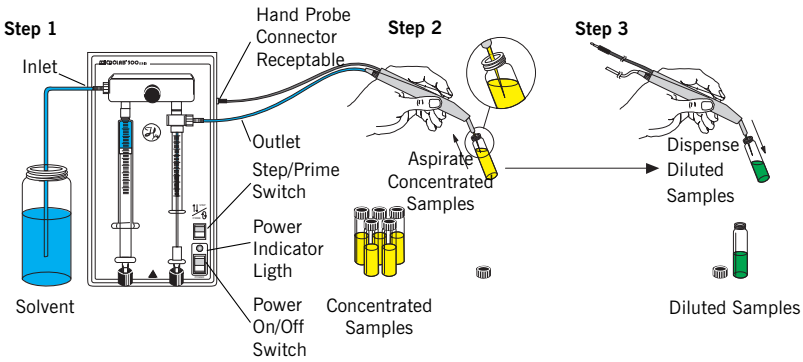


Figure 2: Dilution method type

Method Type	ML 500 series A	ML 500 series B/BP	ML 500 series C	Method Illustrations
1. Simple Dilution 2. Pipette (with disposible Tip)	•	•	•	Fill diluent; Aspirate sample; Dispense sample & diluent
Serial dilution (programmed)		•	•	1/10; 1/25; 1/50; 1/100
Serial dilution (tube to tube)		•	•	Sample; 1/10; 1/100; 1/1000
Multi-sample reagent dilution (or internal standard addition)		•	•	Fill diluent; Aspirate sample; Aspirate standard; Dispense standard sample & diluent
Return to reservoir		•	•	Save reagent in the fluid path by returning to reagent reservoir

Blue=diluent Yellow=sample Orange=standard Green=diluted sample Purple=diluted sample+standard

All Microlab® 500A, 500B and 500BP diluters are shipped ready for immediate use. A user's manual in English is supplied unless another language is requested.


MICROLAB® 500 SERIES
GASTIGHT® #1005

Microlab® 500 Dispensers

- Save time during sample preparation
- Eliminate technician-to-technician metho dariability
- Simplify compliance-to-method documentation requirements for regulations and standards, such as those of the EPA, FDA (GLP, GMP), and ISO
- Perform aliquot, serial, simple, or titrate dispenses
- Reduce reagent and solvent consumption
- Achieve certified accuracy within ±1.0% and precision within +0.2%, traceable to N.I.S.T.

Microlab® 500 dispensers simplify sample preparation methods requiring sample or reagent dispensing. Aliquot, serial, simple, and titrate dispenses can easily be performed with a simple touch-of-a-hand probe button or a tap-of-a-foot switch. Both single and dual syringe drives are available to either double throughput or double the volumes dispensed. Volumes less than 1 μL to 50 mL can be dispensed accurately and reproducibly.

Ordering information

Single Program Memory, Microlab® 500A Series

Model	Part #	Description
ML501A	RML501115	Single Syringe Dispenser, 115VAC
ML501A	RML501220	Single Syringe Dispenser, 220VAC
ML504A	RML504115	Dual Syringe Dispenser, 115VAC
ML504A	RML504220	Dual Syringe Dispenser, 220VAC

21 Program Memory, Microlab® 500B Series

Model	Part #	Description
ML510B	RML510115	Single Syringe Dispenser, 115VAC
ML510B	RML510220	Single Syringe Dispenser, 220VAC
ML540B	RML540115	Dual Syringe Dispenser, 115VAC
ML540B	RML540220	Dual Syringe Dispenser, 220VAC

21 Program Memory, Microlab® 500BP Series

Model	Part #	Description
ML512BP	RML512115	Single Syringe Dispenser with print function*, 115VAC
ML512BP	RML512220	Single Syringe Dispenser with print function*, 220VAC
ML542BP	RML542115	Dual Syringe Dispenser with print function*, 115VAC
ML542BP	RML542220	Dual Syringe Dispenser with print function*, 220VAC

* includes printer and printer paper

PC Controlled, Microlab® 500C Series

NModel	Part #	Description
ML511C	RML511115	Single Syringe Dispenser without controller, 115VAC
ML511C	RML511220	Single Syringe Dispenser without controller, 220VAC
ML541C	RML541115	Dual Syringe Dispenser without controller, 115VAC
ML541C	RML541220	Dual Syringe Dispenser without controller, 220VAC

How a Dispenser Works

Dispenses, including titrations, can be made in two easy steps (after priming the instrument) as shown in Figure 1.

Step 1: Fill the syringe(s) with the programmed amount of reagent from the reservoir.

Step 2: Dispense the programmed amount(s) into a microwell plate, test tube, vial, etc. to complete the dispense cycle.

In addition to simple dispenses performed in all Microlab® 500 dispensers, models ML510B, ML512BP, ML540B, ML542BP, ML511C and ML541C can also perform aliquot, serial, pipette and titrate dispenses. See Figure 2.

Figure 1: A simple, dual dispense

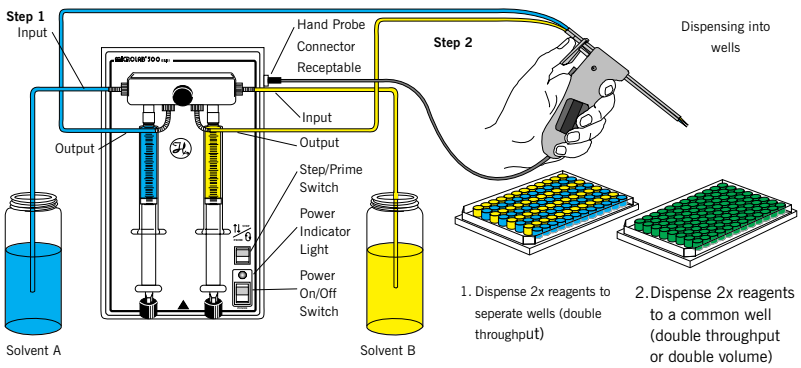


Figure 2: Dispense method types

Method Type	ML500 Series			Method Illustration	
	A	B/BP	C		
Simple dispense	•	•	•		Reagent is filled from a reservoir and dispensed
Aliquot dispense		•	•		Repetitive dispense with constant final volume
Serial dispense		•	•		Repetitive dispense with a variable final volume
Pipette		•	•		Aspirate sample then dispense
Titrate		•	•		Repetitive dispense to endpoint
Reagent dilution (dual syringe only)	•	•	•		Addition of two reagents to a common vial
Return to reservoir		•	•		Save reagent in the fluid path by returning to reagent reservoir

Blue=diluent Purple=titrarion endpoint Green=diluted sample Yellow=sample

Microlab® 500 Diluter/Dispenser

- RS-232 or TTL communication interfaces
- Daisy chain up to 16 units
- Certified accuracy within ±1.0% and precision within +0.2%, traceable to N.I.S.T.
- Syringe speeds from 1 to 250 seconds per stroke

Microlab® 500 dispensers are ideal for OEM applications and production-filling operations where stand-alone precision dispensers are required. Use a single instrument or daisychain up to sixteen units for repetitive dispensing of the same fluid, different fluids, or variations of dilutions. The ML500 instruments can be controlled by RS-232 communication or by switch closure activation. Dispense volumes of < 1 µL to 50 mL are available with pump speeds ranging from 1 to 250 seconds per syringe stroke or greater.

Microlab® Diluter/Dispenser Ordering Information

Model	Part #	Description
ML511C	RML511115	Single Syringe Dispenser, 115VAC
ML511C	RML511220	Single Syringe Dispenser, 220VAC
ML531C	RML531115	Dual Syringe (single valve) Diluter, 115 VAC
ML531C	RML531220	Dual Syringe (single valve) Diluter, 220 VAC
ML541C	RML541115	Dual Syringe (single valve) Dispenser, 115 VAC
ML541C	RML541220	Dual Syringe (single valve) Dispenser, 220 VAC
ML543D	RML543115	Dual Syringe (independant valves) Dispenser, 115 VAC
ML543D	RML543220	Dual Syringe (independant valves) Dispenser, 220 VAC

ML 543D

Modular Valve Positioners

- Bi-directional valve movementand control
- Versatile serial (RS-232) or digital (TTL) communication
- Easy, „snap-in, snap-out“ valve replacement automates any of 16 different HAMILTON valve configurations
- Wetted paths are chemically inert TEFLON® and Kel-F® materials

The Modular Valve Positioner (MVP) is a self-contained, bi-directional valve positioner used for fluid selection and redirection. The MVP allows you to redirect fluid distribution using RS-232 communication or TTL output. One MVP is easily configured for any of sixteen HAMILTON valve configurations through DIP switch settings on the back of the unit.

Easy Valve Replacement

All MVP's use HAMILTON's tool-free, "snap-in, snap-out" HVM and HVXM inert plug valves. Sixteen different valve configurations, including on/off, loop, and distribution, meet almost any fluid selection or redirection application. Valve porting diameters of .059" (1.5 mm) and .118" (3.0 mm) are available allowing you to optimize fluid flow characteristics.

Bi-directional Valve Rotation

Both the RS-232 and TTL MVP's are capable of clockwise and counterclockwise valve movement. Valve rotational speed is three seconds per full revolution.

Versatile Communication

Any controller or computer capable of RS-232 or TTL output can be used to control the MVP. An example is the control of an MVP via TTL communication from a HAMILTON PSD/2 syringe drive module equipped with an optional EEPROM.

- The Serial (RS-232) MVP has two built-in DB-9 I/O terminals for connection to a controlling computer. Two communication protocols can be used: HAMILTON's Protocol 1/RNO+ or DINProtocol/BDZ+
- The Digital (TTL) MVP has two 8-pin I/O terminals for connection to a controller. Three communication protocols can be used: binary, discrete, or sequential.

Precision Syringe Pumps

HAMILTON's syringe pumps are highly integrated, self-contained modules utilizing state-of-the-art materials. Both DC servo and stepper motor versions are offered to provide the highest standard for accuracy and precision, and linear laminar flow. The pumps are available in several configurations designed for the optimization of your specific fluid handling application. Total syringe volumes from 5 µL to 25 mL are available with pump speeds ranging from 1 to 250 seconds per syringe stroke or greater.

OEM dispensing applications of 1 µL to 50 mL demand a diverse set of performance capabilities. With this in mind, HAMILTON offers precision dispensers from „stand-alone", remotely activated devices to modular, user-configurable syringe drives, that can be mounted in custom designed racks as sub-assemblies. Both RS-232 and TTL electrical communication interfaces are available.

Syringe Pump Model	Description
PSD/2 modules	DC stepper motor-driven, syringe pumps with both logic and driver boards self-contained
PSD/3 modules	DC servo motor-driven, syringe pumps with both logic and driver boards self-contained; low profile feature
ML500 modules	DC stepper motor-driven, basic syringe pump with separate PCB for both logic and driver components; includes micro-stepping feature

Clinical Applications

- Blood Alcohol Analysis Using a Microlab® 530B Diluter
- Cyclosporine Assay Using a Microlab® 530B Diluter

Analytical Applications

- Large Volume (1 to 5 mL) Sample Dilutions Using Microlab® 500 Instruments

Biotechnology Applications

- Topical Application Methodology for Bioassays Using a Microlab® 530B Diluter
- Industrial/Process Applications Precise Fluid Dispensing On-line and in Productionfilling Environments

Application examples:

Blood Alcohol Analysis Using a Microlab® 530B Diluter

Overview

Forensic-related laboratories commonly measure blood alcohol levels. The purpose is to determine DUI (driving under influence) suspects, as well as, the cause of illness or death of patients.

Application

HAMILTON's Microlab® 530B Diluter is used to precisely dilute duplicate samples, controls, and standards for blood alcohol analyses. The 21-program memory enables various dilution ratios to be stored to increase blood sample throughput. A typical assay aspirates 500 µL of blood, with the relative amount of n-propanol as an internal standard, along with the diluent. The multi-aspirate command feature of the Microlab® diluter allows the blood sample to be „sandwiched" between the diluent and the n-propanol internal standard. Dis-pensing of the standard, sample, then lastly diluent eliminates the possiblility of carryover or cross-contamination in the tubing line, since the diluent volume „washes" the inside of the tubing. Sample preparation time is cut in half, while sample throughput is doubled.

Cyclosporine Assay Using a Microlab® 530B Diluter

Overview

Cyclosporine (CsA) is a unique immune suppressant used to prevent the rejection of transplanted organs and to treat diseases of autoimmune origin. Monitoring parent drug CsA concentrations in whole blood and interpreting these concentrations in conjunction with other laboratory data and clinical considerations is the most effective means of ensuring adequate immunosuppressant therapy for recipients of solid organ transplant. CsA has a very narrow concentration range for safe and effective therapy. Inadequate CsA dosages may result in rejection of the transplanted organ, while high levels of CsA may cause acute nephrotoxicity. In transplant recipients, CsA may also cause a variety of additional toxic side effects.

Application

The cyclosporine assay is routinely performed at the Prince of Wales Hospital, Australia. HAMILTON's Microlab® 530B Diluter is used with the cyclosporine assay to provide greater accuracy and improved precision over conventional pipetting protocols. Doris Lee, head of the Clinical Chemistry Department, outlined the requirement to lyse the cells, solubilize the cyclosporine, and precipitate most of the blood protein, with methanol, prior to the assay. The Microlab® diluter is used to pipette whole blood samples using methanol as a system diluent. The multi-aspirate command feature of the Microlab® diluter allows the separation of aspirated components with air gaps to eliminate sample and diluent mixing, and to minimize potential sample loss along the tubing line due to wall effects.

Submitted by: Alltech ssociates Pty. Ltd., P.O. Box 6005, Baulkham Hills Business Centre NSW 2153, Australia.

Featured HAMILTON Diluter and Dispenser:

AA/ICP, GC and HPLC Dilutions

Microlab® 500 Series diluters are designed to save time preparing samples and standards for AA/ICP, GC and HPLC. Common dilutions for concentrated out-of-range samples can be prepared in half the time as compared to manual methods using volumetric flasks. With certified accuracy within ± 1.0% and precision within + 0.2%, dilutions can be made in small quantities to reduce solvent consumption and waste disposal costs. This also reduces the amount of sample or standard required. To simplify method documentation for regulatory compliance, a print function is available.

Diluters and Dispensers Service

Microlab® diluters and dispensers are supported by a worldwide network of HAMILTON authorized service providers. This worldwide network is committed to providing excellence in warranty and post-warranty support. All depot repairs include a HAMILTON Certificate of Quality certifying precision and accuracy and a Service Report detailing repair information. Repairs include a 60-day labor warranty and one-year service parts warranty. Turnaround for repairs is 10 to 15 days. When returning an instrument for repair please ensure that the instrument is decontaminated. To minimize any potential health risks, we ask that you not send tubing, valves, or syringes. Any tubing, valves, or syringes should be disposed of, with replacement costs being your own responsibility. Your cooperation in minimizing the biohazard risks to our employees is appreciated.

Concorde Push-button Hand Probe

Fits easily into the hand for Index-finger actuation. Accomodates either 12-gauge or 18-gauge tubing

Part #	Instrument
R35529	ML500 Series

Dual Push-button Hand Probe

Fits into your hand in a pistol-grip fashion for thumb actuation. Accomodates either 12-gauge or 18-gauge tubing

Part #	Instrument
R35767	ML500 Series

Luer Lock Needle Push-button Hand Probe

Allows you to install Kel-F® hub needles for injection into animals, piercing of a septum or dispensing fluids onto a small surface.

Part #	Instrument
R35899	ML500 Series

Disposable Tip Push-button Hand Probe

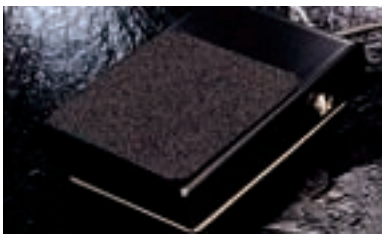
Designed for blood and serum work where sample cross-contamination is a concern. This probe has a single-dispense button and atip ejection button. Available in two volumes.

Part #	Instrument
R77006	ML500 Series
R77007	ML500 Series
R75700	100 µL tips, 1000/pk
R1006-06	300 µL tips, 96/rack, 10 racks/box

Large Volume Sample Hand Probe

Ideal for large volume sampling (1-5 ml) and diluting viscous fluids. A disposable tip eliminates sample cross-contamination.

Part #	Instrument
R35898	ML500 Series
R75702	5 ml Tips, 250/pk



Foot Switch

Activate your diluter and dispenser with the tap-of-a-foot instead of by hand

Part #	Instrument
R77004	ML500 Series

Reagent Bottle Holder

The bottle holder helps minimize tubing dead volume from reagent bottle to hand probe.

Part #	Description
R39111	Bottle Holder

Tubing Clip

The tubing clip holds TEFLON® tubing (12 or 18 gauge) to most lab vessels

Part #	Description
230010	Tubing Clip

Instruction Manuals

Language	Microlab® 500A Series	Microlab® 500B Series
English	R69175	R69176
French	R69181	R69182
German	R69179	R69180
Portuguese	R69185	R69186
Spanish	R69187	R69188

Microlab® 500 GASTIGHT® Instrument Syringes

- TEFLON® Luer Lock (TLL) syringe termination
- The standard in the industry
- Used with HAMILTON instruments and syringe pumps
- TLLX syringes with plunger stops

		Diluter Syringes	Diluter Syringes	Dispenser Syringes
		DX	TLLX (with plunger stop) TLL	
Model	Volume	right side	left side	right side & left side
1702	25 µL	80226	R80222 TLLX	
1705	50 µL	80926	80922 TLLX	
1710	100 µL	81026	81022 TLLX	
1725	250 µL	81126	81122 TLLX	
1750	500 µL	81226	81222 TLLX	
1001	1 mL	81326	81323 TLLX or 81320 TLL	
1002	2,5 mL		81420 TLL	
1005	5 mL		81520 TLL	
1010	10 mL		81620 TLL	
1025	25 mL		R82521 TLL	

TEFLON® FEP, Tubing

Instrument syringe plunger stops are used on syringe volumes of 25 µL to 500 µL.

They serve a triple purpose:

1. Instrument syringe plunger stops are used on syringe drive or pump
2. Allow accurate attachment of the syringe to the drive drive arm mechanism
3. Optimize zero stop adjustment

Guage/Length/Hub	Used with	Fill	Dispense
Style	Syringe Volumes	Tubing	Tubing
18/650 mm/1 hub, M6	≤ 1 ml	240010	
18/900 mm/1 hub, M6	≤ 1 ml		240130
12/650 mm/1 hub, M6	> 1 ml	240000	
12/900 mm/1 hub, M6	> 1 ml		240360

Diluter and Dispenser Valves

Part #	Valve Type	For use on instrument model
R35825 	Single dispenser valve	ML501A, ML510B, ML512BP
R35844 	Diluter valve	ML503A, ML530B, ML532BP
R35842 	Dual dispenser valve	ML504A, ML540B, ML542BP

Print Function Upgrade

Part #	Description
R35905	ML500B Print Function Upgrade Kit* 115VAC, includes: controller, cable, printer, and printer paper
R35906	ML500B Print Function Upgrade Kit* 220VAC, includes: controller, cable, printer, and printer paper
R2697-01	Printer Cartridge
R2695-01	Printer Paper, rolls 5/pk
R2807-01 (Rev B)	Print function instructions addendum

* for use with ML500B instruments, e.g. ML510B, ML530B and ML540B

Microlab® 500 Specifications

Specifications	Microlab® 500A	Microlab® 500B/BP	Microlab® 500C
Accuracy	Within ± 1%	Within ± 1%	Within ± 1%
Precision	Within ± 0.2%	Within ± 0.2%	Within ± 0.2%
Resolution	0.1% of syringe volume	0.1% of syringe volume	0.1% of syringe volume
Volume Increment	0.1% to 100% of total syringe volume	0.1% to 100% of total syringe volume	0.1% to 100% of total syringe volume
Speed	2 to 20 seconds per full syringe stroke	1 to 250 seconds per full syringe stroke	1 to 250 seconds per full syringe stroke
Syringe Drive Mechanism	Stepper motor driven high precision lead screw with encoder	Stepper motor driven high precision lead screw with encoder	Stepper motor driven high precision lead screw with encoder
Power Requirements	100-240VAC; 50-60 Hz	100-240VAC; 50-60 Hz	100-240VAC; 50-60 Hz
Power Rating	80 VA	80 VA	80 VA
Program Memory	One program retained while power is on	21 programs retained in battery back-up memory, 1 program stored in EEprom	1 program stored in EEPROM program must be down-loaded from a PC or 500 B/PB controller
Communication Interface	Microlab® 500A Controller only	Microlab® 500B & 500BP Controllers; RS 232C, Baud rate selectable; TTL out	RS 232C Baud rate selectable TTL out
Baud Rate	Factory set	1200-38,400, selectable	1200-38,400, selectable
Weight	10 lbs 6 oz (4.7 Kg)	10 lbs 6 oz (4.7 Kg)	10 lbs 6 oz (4.7 Kg)
Height	13 1/8″ (33.34 cm)	13 1/8″ (33.34 cm)	11 1/8″ (28.26 cm)
Width	6 1/8″ (15.56 cm)	6 1/8″ (15.56 cm)	6 1/8″ (15.56 cm)
Depth	7″ (17.78 cm)	7″ (17.78 cm)	7″ (17.78 cm)
Fluid Path	TEFLON® PTFE and borosilicate glass	TEFLON® PTFE and borosilicate glass	TEFLON® PTFE and borosilicate glass
Shipping Weight	20 lbs (9.07 Kg)	20 lbs (9.07 Kg)	19 lbs (8.6 Kg)
Certifications	CE, CSA, TÜV/GS	CE, CSA, TÜV/GS	CE, CSA, TÜV/GS

All Microlab® 500 Diluters and Dispensers are shipped from the factory fully tested, traceable to N.I.S.T. standards.

Your HAMILTON representative:

HAMILTON
the measure of excellence

ISO 9001 CERTIFIED

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