

## M Series Liquid Handling Pump

- Continuous, bidirectional flow
- Two models:
  - M6: 5 nl/min to 5 ml/min
  - M50: 1 µl/min to 25 ml/min
- Mechanically simple
- No syringes to refill or break
- RS-232 and RS-485 control



### Description

The Cheminert® M Series liquid handling pump is a syringe-free pump capable of delivering a bidirectional flow to six orders of magnitude. It is a positive displacement pump, which means that it is self-priming and tolerant of any gas which may find its way into the fluid lines. Since there is no separate fill cycle, the pump can be operated continuously, and volumetric capacity is limited only by time. (*Note: High speed continuous flow will reduce the pump lifetime.*)

RS-232 and RS-485 communication protocols are incorporated into the microprocessor-driven controller. (USB interface requires an adapter.)

The pump comes complete with M6-LHS software, which employs standard liquid handling terminology and an integrated valve control package in a familiar Windows format for everyday lab usage. For more advanced control of system parameters, IMS (Intelligent Motion Systems) software can be downloaded directly from the IMS website at [www.imshome.com](http://www.imshome.com).

### Operating Principle

At the core of the pump is a rotor which houses four pistons. As the microstepper motor turns the rotor, the pistons float on a stationary cam; at any given moment, one piston is filling, one is dispensing, and the other two are in transit between the fill and dispense positions.

### Applications

The M Series pump is recommended for any liquid handling applications requiring accuracy and precision. It is particularly suited for applications with a wide range of volumes (which entail laborious syringe changes with other pumps) and for applications which benefit from the versatility provided when the pump is coupled with the optional multiposition reagent selection valve. Typical applications include:

- Calibration source for mass spectroscopy
- Flow-based electrochemical systems
- Flow cytometry, cell and drug perfusion
- HTS and robotic systems
- Infusion and micro-dialysis
- LC applications – micro flow, micro gradients
- Mass spectroscopy sample introduction
- Micro diluters/dispensers for nl to ml range applications
- Micro liquid transfers for micro arrays
- Microtiter plate dispensing using multiposition valves
- Post-HPLC column reagent addition, stop flow, peak collection
- Precision dispensers and sampling devices (such as autosamplers)
- Sample introduction systems for ICP nebulizers

## Specifications

Power requirement	Both Models (M6 and M50)	
Rest current draw	0 mA	
Operational current draw	Typical 800 mA, 1600 mA at acceleration	
Voltage	Typical 24 VDC, input voltage 12 - 48 VDC	
Communications (COM1 or COM2)		
Type	RS-232 standard, RS-485 (RS-422) optional	
Baud rate	Default 9600 bps, Full range 4800 - 38,800 bps	
Parity	None	
Data bits per character	8	
Stop bits	1	
Error checking	None	
Mode	ASCII	
Environmental		
Operating Temperature	0 - 50°C	
Operating Humidity	< 90% non-condensing	
Storage Temperature	-20°C - 70°C (dry)	
Motor		
Type	2 Phase Bipolar (1.8° per step)	
Planetary Gear Assembly	M6	M50
Ratio	1:4.75	1:9.88
Physical Specifications		
Weight: pump	520 g	540 g
motor and gear assy.	530 g	600 g
micro-electric controller	300 g	300 g
power supply	300 g	300 g
Resolution	MSEL=256	MSEL=256
Minimum flow	5 nL/min	1 µL/min
Maximum continuous flow	5 mL/min	25 mL/min
Maximum intermittent flow*	10 mL/min	35 mL/min
Maximum back pressure	100 psi	100 psi
Volume accuracy (%error)	±0.5% at 1.25 mL ±0.5% at 125 µL	±0.5% at 8 mL ±0.5% at 800 µL
Volume precision (%CV)	<0.1% at 1.25 mL <0.5% at 125 µL	<0.1% at 8 mL <0.5% at 800 µL
Fittings	1/16" Valco detail (10-32)	1/8" Cheminert (1/4-28)
Fluid contact	PTFE, Sapphire, PAEK, Viton®, and Valcon P	PTFE, Ceramic, Valcon H2

\* High speed continuous flow or the use of chemicals incompatible with the wetted surfaces will reduce pump lifetime.



## Ordering Information

For best service, please call to discuss your application before placing your order.

### Model M6

Description	Product number
Pump with controller and stepper motor	CP2-4841-100M1
Pump with stepper motor, no controller	CP2-4841-100SM
Pump only	CP2-4841-100D
Accessories and replacement parts	
Pump motor	CP-DSM
Controller, MicroLynx-4	CP-CM1-P
PTFE tubing, 10' x 1/16" x 0.030" ID	TTF130-10

### Model M50

Description	Product number
Pump with controller and stepper motor	CP3-8182-625M2
Pump with stepper motor, no controller	CP3-8182-625SM2
Pump only	CP3-8182-625D
Accessories and replacement parts	
Pump motor	CP-DSM2
Controller, MicroLynx-4	CP-CM1-P
PTFE tubing, 10' x 1/8" x 0.060" ID	TTF260-10

North America, South America, and Australia/Oceania contact:

**VICI Valco Instruments Co. Inc.**  
 tel: 800 367-8424  
 fax: 713 688-8106  
 valco@vici.com

Europe, Asia, and Africa contact:

**VICI VIGI AG International**  
 tel: Int + 41 41 925-6200  
 fax: Int + 41 41 925-6201  
 info@vici.ch

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