

Choosing a Metering Pump



Metering pumps move precise volumes of liquid in a specified time period to provide accurate flow rates. This class of pumps moves liquids in two stages: the suction stroke and the discharge stroke. During the suction stroke, liquid is pulled into the pump cavity past the inlet check valve. During the discharge stroke, the inlet valve closes; the outlet valve opens, and the liquid is pushed out.

Bellows Pumps move a bellows back and forth to displace liquid. These pumps do not require seals. Special nonclogging valves are available for abrasive or particulate applications.

Diaphragm Pumps pulse a flexible membrane to displace liquid with each stroke. These pumps require no seals, so you can pump abrasives and slurries if the valves are kept clean.

Peristaltic Pumps are designed so that the only material in contact with the fluid being pumped is the tubing. This allows the fluid to not contaminate the pump and the pump to not contaminate the fluid. These pumps provide flexibility through the wide variety of tubing materials available.

Piston Pumps use a reciprocating plunger to move liquid through the pump. These pumps require a seal to prevent leaks and are not recommended for use with abrasive fluids.

Syringe Pumps either draw in or push out liquid through a syringe to obtain a known volume as determined by the size of the syringe. Syringe pumps are great for low flow, low pressure applications.

Pump type	Advantages	Flow rating	Maximum pressure		Self-priming	Pulseless flow	Viscous fluids	Particulate matter	Run dry
			psi	bar					
Bellows	Can pump liquids or gases.	6 to 2475 mL/min	50	3.4	Good	Poor	Fair	Yes	No
Diaphragm	Ideal for high-accuracy applications, such as pH/ORP control.	0.08 to 4167 mL/min	5000	344.7	Good	Poor	Good	No	Yes
Peristaltic (tubing)	Noncontaminating; tubing is available in a wide variety of materials.	0.9 to 3400 mL/min	125	8.6	Excellent	Good at high rpm	Good	Yes	Yes
Piston	Highest pressure and accuracy; ideal for HPLC applications.	0.02 to 2901 mL/min	18,000	1241	Good	Poor	Fair	No	No
Syringe	Handle very low flow rates.	0.001 μ L/min to 147 mL/min	100	6.9	N/A	Excellent	Poor	No	Yes

Cole-Parmer® Syringe Pumps Optimize low-flow, low-pressure applications

- Backlit alphanumeric LCD guides you through setup and operating procedures
- Don't lose your settings—nonvolatile memory retains settings even after pump is turned off

A. Single-Syringe Infusion Pump automatically selects display units based on syringe used, obtaining precise flow rates down to 0.2 μ L/hr. A wide dynamic range (6000:1) provides excellent flexibility.

B. Multi-Syringe Pumps achieve flow rates down to 0.001 μ L/hr. Easy programming via keypad—infusion/withdrawal pumps sequence operations. Control from a computer with RS-232 interface.†

C. Multi-Step Multi-Syringe Pumps allow flow rates to vary from a slow trickle to a steady stream down to 0.001 μ L/hr. Program up to 8 commands and repeat up to 10 times. Pumps allow you to program flow rate hold, pause, and change of direction; each program can be run up to 12 hours. Pumps can also sequence operations. Operate your pump from a computer—great for daisy-chaining pumps!



Pump continuously and automatically delivers exact quantities of liquid.



Specifications

Accuracy: \pm <1%
Reproducibility: \pm 0.1%

Description	Number of syringes accepted	Flow rate per syringe	Syringe size accepted	Linear force	Power (VAC, Hz)	Catalog number	Price
A. Single-syringe pump							
Infusion	1	0.2 μ L/hr to 500 mL/hr	10 μ L to 60 mL	20 lb (9.1 kg)	115, 50/60 230, 50/60	GY-74900-00 GY-74900-05	
B. Multi-syringe pumps							
Infusion	2	0.001 μ L/hr to 147 mL/min	10 μ L to 140 mL	40 lb (18.1 kg)	115, 50/60	GY-74900-10	
	10				230, 50/60	GY-74900-15	
Infusion/withdrawal	2	0.001 μ L/hr to 147 mL/min	10 μ L to 140 mL	40 lb (18.1 kg)	115, 50/60	GY-74900-30	
	10				230, 50/60	GY-74900-35	
Infusion/withdrawal	2	0.001 μ L/hr to 147 mL/min	10 μ L to 140 mL	40 lb (18.1 kg)	115, 50/60	GY-74900-20	
	10				230, 50/60	GY-74900-25	
Infusion	2	0.001 μ L/hr to 147 mL/min	10 μ L to 140 mL	40 lb (18.1 kg)	115, 50/60	GY-74900-60	
	10				230, 50/60	GY-74900-65	
Infusion/withdrawal	2	0.001 μ L/hr to 147 mL/min	10 μ L to 140 mL	40 lb (18.1 kg)	115, 50/60	GY-74900-80	
	10				230, 50/60	GY-74900-85	
Infusion/withdrawal	2	0.001 μ L/hr to 147 mL/min	10 μ L to 140 mL	40 lb (18.1 kg)	115, 50/60	GY-74901-00	
	10				230, 50/60	GY-74901-05	
Infusion/withdrawal	2	0.001 μ L/hr to 147 mL/min	10 μ L to 140 mL	40 lb (18.1 kg)	115, 50/60	GY-74901-10	
	10				230, 50/60	GY-74901-15	

†Order RS-232 cables separately.