SYRINGE PUMPS

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Precision Flow Delivery

Our syringe pumps are acknowledged as the industries highest valued solution for delivering precise and smooth flow in research, pilot plant and production applications.

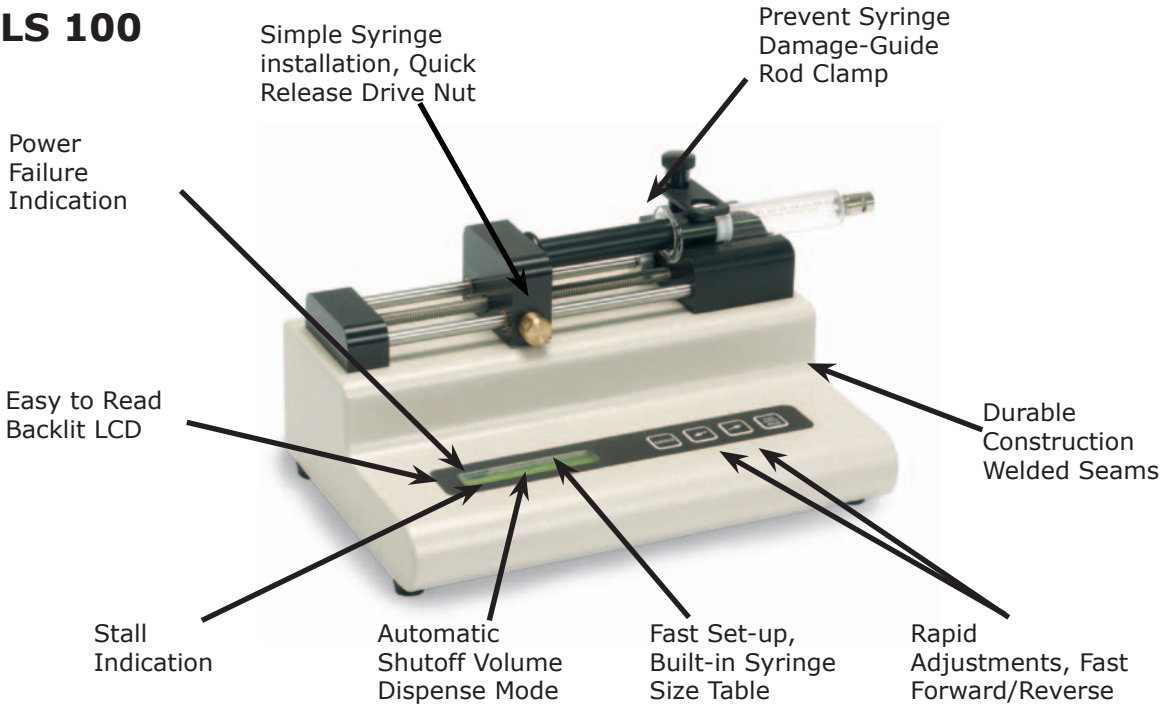
Advantages:
* High precision flow delivery for maximum reproducibility
* Pulseless Flow - great for pulse sensitive applications
* Easy to use - menu driven set-up
* Remote control - interface to computer/ foot pedal/valves
* Reliable - thousands of units in operation worldwide
* All pumps available in CE marked versions

SETUP is as easy as 1-2-3.

1. Select syringe from displayed table.
2. Enter volume to be dispensed.
3. Enter flow rate, then press "start" button.

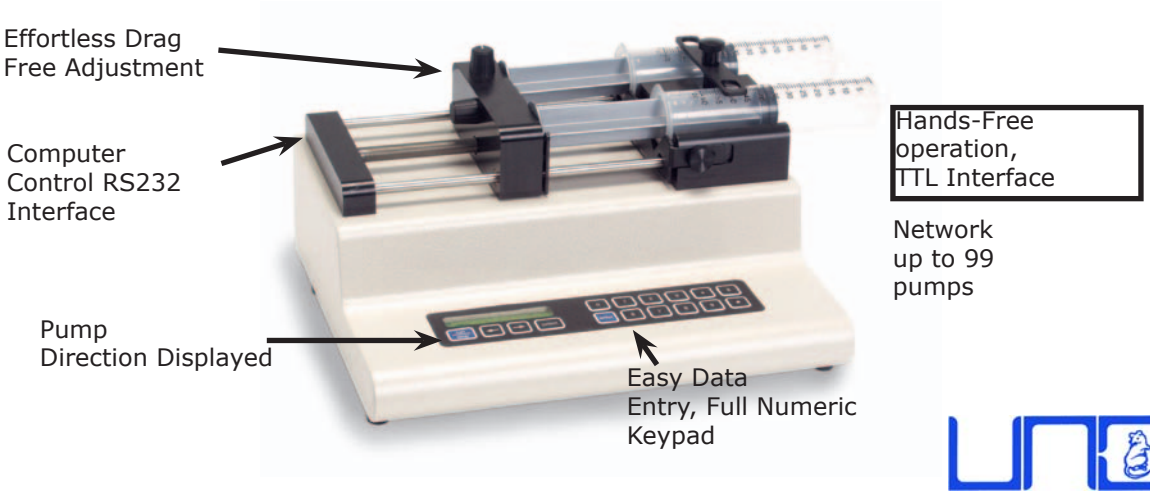
It's that fast ... and that simple!

MODELS 100



MODELS 200

All features of a model 100 plus...



Infusion Pumps

Our infusion pumps are ideal for delivering accurate and precise amounts of fluids for a multitude of applications including injection of calibrant into a mass spectrometer or reaction chamber, long term drug delivery to animals and general infusion applications. Customers use the model 100 / model 200 syringe pumps more than any opther for their outstanding reliability and performance. The Model 100 series pumps give customers the most cost effective solution for infusing fluids, alternatively, the model 200 series gives the customers advanced features with RS232 and TTL interfaces. All Series pumps can be daisy chained together to create a pumping network.

Model 100

Single Syringe Infusion Pump combined precision and simplicity with outstanding ease of use and exceptional durability.

* Single Syringe 10µl to 60ml, any manufacturer
* Wide flow range up to 519 ml/hr

Model 200

Two-Syringe Infusion Pump
This feature-laden Two-Syringe Infusion Pump combines a broad speed range and holds a wide range of syringe sizes to meet the requirements of virtually any laboratory application.

* Minimum flow 0,001µl/hr with 10µl syringe
* Holds one of two syringes, 10 µl to 140 ml each.

Model 101 Two-Syringe Nanoliter Pump

Our two-syringe Nanoliter Pump is ideal for microdialysis and similar applications which require virtually pulseless flow at very low flow rates.

* Holds 2 syringes, up to 10ml each or, a single syringe up to 60ml
* Minimum flow 1 nanoliter/hr. (10ml syringe)

Model 220 Multi-Syringe Infusion Pump

Model 220 is ideal for applications requiring multiple syringes. This pump has been modified to hold up to 10 syringes,

* Multiple syringe holder:
  - One to ten syringes, up to 10ml
  - One to six syringes, 20ml - 60ml
  - One to four syringes, 100ml - 140ml

Model 250 Four-Syringe Nanoliter Infusion Pump

Each syringe can be sized differently and is clamped independently.

* Multiple syringe holder:
  - Four syringes up to 10ml each
* Separate clamping accommodates different sizes
* Syringes may be positioned independently for sequential dispensing by the pusher block.

Infusion / Withdrawal Pumps

Infuse and withdraw capabilities provide maximum flexibility for varied applications. This feature premits applications such as automatic withdrawal of samples and unattended filling of syringes at very low flow rates. The unique model 310 offers a remote pump head, which is perfect when space is limited. The small size and exceptional low flow rate capability allows direct mounting of the model 310 on a stereotaxic manupulators without the need for long narrow tubing which is both difficult to use and requires larger volumes of valuable fluids.

Model 210

Two-Syringe Infusion/Withdrawal Pump

Model 210 offers you more advanced features than any other infusion/withdrawal pump in its price range - including five operating modes plus independent rate and volume settings for both infusion and withdrawal.

* Holds two syringes, 10ml to 140ml each
* Multiple mode selection:
  - Infusion, Withdrawal, infusion then withdrawal, Withdrawal then Infusion, Continuous Cycle.

Model 230

Multi Syringe Infusion/Withdrawal Pump

Ideal for applications requiring multiple syringes, the model 230 is an adaptation of the model 210. The pump has been modified to hold up to 10 syringes.

* Multiple syringe holder:
  - One to ten syringes, up to 10ml
  - One to six syringes, 20ml - 60ml
  - One to four syringes, 100ml - 140ml
* Multiple mode selection:
  - Infusion, Withdrawal, infusion then withdrawal, Withdrawal then Infusion, Continuous Cycle.

Model 310

Nanoliter Syringe Pump

The model 310 Reversible Nano Pump is used exclusively with micro syringes. Samll size, remote pump head and a rugged mounting arm make it ideal for use with micromanipulator, stereotaxic and other clamping devices.

* Mini Size pump
* Remote pump head
* 1 to 100 µl syringe
* Minimum flow of 0,01µl/minute

Push-Pull Pumps

These proven pumps provide simultaneous infusion and withdrawal with opposing syringes on a single drive. The model 120 and Model 260 are adapatations of the Model 100 and Model 210, respectively. Each has been modified to hold an additional syringe so that as one syringe infuses, the second syringe withdraws at the same rate.

Model 260
Four-Syringe Push-Pull Pump
This model provides simultaneaous infusion and withdrawal with opposing syringes on a single drive.
Note: When not used in push/pull mode, the pump has all features of the Model 210.

* Holds up to four syringes, 10ml to 60ml each.
  With large syringes, the full volume may not not be usable.

Model 120
Two-Syringe Push-Pull Pump
This pump provides silmultaneous infusion and withdrawal at the same rate opposing syringes on the same drive screw. The push/pull mode is designed for one cycle only.

* Holds two syringes 10µl to 10ml each
* Minimum flow 0.003µl/hr (10µl syringe)

Continuous Cycle Syringe Pump

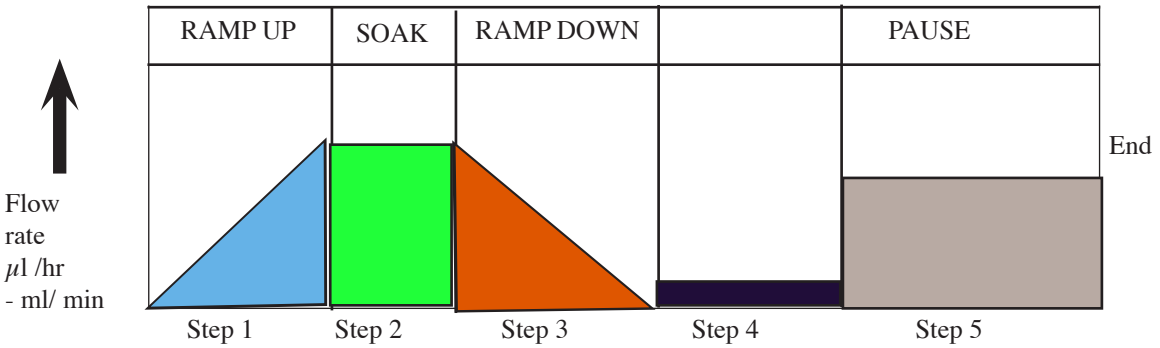
Model 270
Two-Syringe Push-Pull PumpContinuous Cycle Syringe Pump (formerly Model 210C)
The Model 270 can hold up to four syringes and can cycle continuously back and forth in a push-pull action. As two syringes are infusing, two syringes are withdrawing at the same rate. At the end of the set volume the direction is automatically reveresed and the next cycle begins. With the use of 3-way valves, the pump can empty and refill syringes for a continuous dispense.

* Holds four syringes, 10ml to 60ml each. With larger syringes the full volume maty not be useable.
  (60ml syr - 40ml useable, 30ml syr - full).

Keypad Programmable Pumps

Keypad programmable option now available with all Model 200 Series syringe pumps... Lets you program right from the keypad.

Simply follow a few menu-driven prompts and in just minutes you can customize a program to: control the pump from seconds to days, change flow rates, pause, ramp rates up or down automatically, control outputs and respond to external TTL signals.



Unlike other programmable pumps, there's no need to enter time increments or decrements between start and end flow rates. The pumps provide a smooth, linear transition automatically.

A program is divided into eight varaible time periods calles steps. A step can be up to 12 hours long and may be changed without affecting the other steps.

Each step offers these options:

1. Time duration, from one second up to 12 hours
2. Travel direction - Infuse or withdraw (where available)
3. Beginning flow rate (µl/hr to ml/min range)
4. End flow rate (µl/hr to ml/min range)
5. Pause - Waits for an external trigger to start.
6. Status of output TTL pins.
7. Loop option - Loops back to any previous step and repeats the intermediate steps. two seperate loops available.
8. Ste the count in the loop circle. Steps may be repeated up to 100 times.
9. Program stored in non volatile memory.

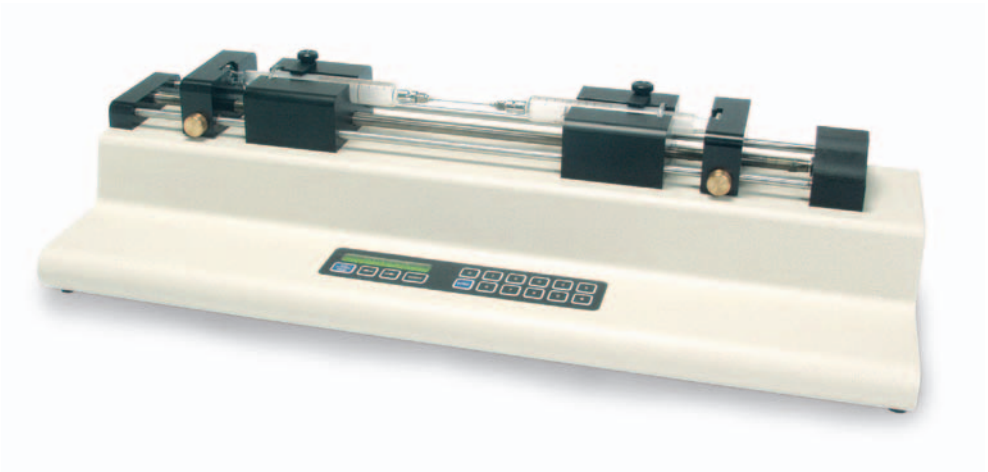
Accessories

Footswitch
Remotely start/stop the Model 200 series pumps with this footswitch. Plugs directly to the TTL interface on the pumps.

RS232 Cable
9 pin female connector with phone jack interface to Model 200 series

Daisy Chain Cable
Connect multiple pumps together. Daisy chain up the 99 model 200 series pumps through the daisy chain cable. Simply connect the first pump to the second pump with one cable and use additional cable to chain the pumps together. Each pump can be given a remote address. communication to each pumps can eb done through the RS232 interface.

Specialty Pump



Model 230 Emulsifier Pump

The Model 330 is designed to emulsify viscious fluids/suspensions by forcing them back and forth through a micro-emulsifying needle. the pump eliminates the fatique and time required to manually prepare the emulsion.

The Model 330 is ideal to prepare an adjuvant/antigen mixture to the correct viscosity ready for injection.

The pump is based on the Model 210 in continuous mode for cycling back and forth and is specifically designed for a 10cc glass syringe and emulsion needle.

* Simple control using a keypad, menu selction and a LCD display
* Volume setting and autamatic cycling
* Rate setting
* Settings stored in memory
* Stall detection

Pump Specifications (all pumps available in CE mark version)

Infusion Pumps					
Model	**100**	**101**	**200**	**220**	**250**
Syringes	One	Two	Two	Ten	Four
Max. No. and Size	10 µl - 60ml each	10 µl - 10ml each	10 µl -140ml each	10 µl - 10ml each	10µl - 10ml each
				Six	(each syringe can
				20ml - 60 each	be a different size)
				Four	
				100ml - 140ml each	
Dimensions	23 x 15 x 12cm	23 x 15 x 12cm	28 x 23 x 15cm	28 x 23 x 15cm	28 x23 x 15cm
Weight	2kg	2,3kg	4kg	4,3kg	4kg
Min Flow Rate					
(10 µl syringe)	0,1 µl/hr	0,001 µl/hr	0,001 µl/hr	0,001 µl/hr	0,001 µl/hr
Max Flow rate					
10 ml syringe	127 ml/hr	0,351 ml/min	21 ml.min	21 ml/min	21 ml/min
60 ml syringe	519 ml/hr	-	86 ml/min	-	-
140ml syringe	-	-	145 ml/min	-	-
Linear Force	9kg	18kg	18kg	18kg	18kg
Advance per Microstep	0,529 micron (1/2 step)	0,088 micron (1/2 step)	0,165 micron (1/16 step)	0,165 micron (1/16 step)	0,165 micron (1,16 step)
Max. Step Rate (1/2 step)	400/sec	400/sec	1600/sec	1600/sec	1600/sec
Min. Step Rate (1/2 step)	1/30 sec	1/30 sec	1/100 sec	1/100 sec	1/100sec
Accuracy	± < 1%	± < 1%	± < 1%	± < 1%	± < 1%
Reproducibility	± 0,1%	± 0,1%	± 0,1%	± 0,1%	± 0,1%
Programmable Model	-	-	200P	220P	250P

Pump Specifications (all pumps available in CE mark version)

	Infusion/Withdrawal Pumps			Push-Pull Pumps		Continu-ous flow
Model	**210**	**230**	**310 plus**	**120**	**260**	**270**
Syringes	Two	Ten	One	One + One	Two + Two	up to Four
Max. No. and Size	10 µl - 140ml each	10 µl - 10ml each	10 µl - 250 µl	10 µl - 15ml each	10µl - 60ml each	10µl - 60ml
		Six				
		20ml - 60ml each				
		Four				
		100ml - 140ml each				
Dimensions	28 x 23 x 15cm	28 x 23 x 15cm	178,8 x 4,4 x 5,1cm*	23 x 15 x 14cm	28 x 23 x 15cm	28 x23 x 15cm
Weight	4kg	4,3kg	2kg	2,3kg	4,3kg	4,3kg
Min Flow Rate						
(10 µl syringe)	0,001 µl/hr	0,001 µl/hr	0,001 µl/hr**	0,1 µl/hr	0,001 µl/hr	0,001 µl/hr
Max Flow rate						
10 ml syringe	21 ml/hr	21 ml/min	145,6 µl/min	127 ml/hr	21 ml/min	21 ml/min
60 ml syringe	86 ml/hr	-	100µl syringe	-	86 ml/min	86 ml/min (30ml)
140ml syringe	145 ml/min	-		-	-	-
Linear Force	18kg	18kg	0,9kg	9kg	18kg	18kg
Advance per Microstep	0,165 micron (1/16 step)	0,165 micron (1/16 step)	0,58 micron (1/2 step)	0,529 micron (1/2 step)	0,165 micron (1/16 step)	0,165 micron (1,16 step)
Max. Step Rate (1/2 step)	1600/sec	1600/sec	916/sec	400/sec	1600/sec	1600/sec
Min. Step Rate (1/2 step)	1/100 sec	1/100 sec	1/4 sec	1/30 sec	1/100 sec	1/100sec
Accuracy	± < 1%	± < 1%	± < 1%	± < 1%		± < 1%
Reproducibility	± 0,1%	± 0,1%	± 0,1%	± 0,1%		± 0,1%
Programmable Model	210P	230P	-	-	260P	270P

* Pump head dimensions
** Using 1µl syringe

Audible alarm option available with all pumps. Keypad programmable option available with all sereis 200 pumps. Pumps for laboratory use only.