

kdScientific

SYRINGE PUMPS SO ADVANCED,
THEY'RE SIMPLE!



MICROPROCESSOR CONTROLLED | EXTREMELY LOW FREE FLOW PULSE RATES | EASY SYRINGE LOADING | FAST FORWARD/FAST REVERSE
CONTINUOUSLY VARIABLE FLOW RATE ACROSS THE FLOW RATE RANGE | MICROSTEPPING MOTOR VIRTUALLY ELIMINATES PULSING
AUTOMATIC SHUTOFF WHEN PRESET VOLUME DISPENSED | AUTOTRACK VOLUME DISPENSE VOLUME DISPLAYED | SYRINGE LIBRARY EASY SETUP

Precision Flow Delivery

kdScientific

So Advanced, They're Simple

KD Scientific pumps are acknowledged as the industries highest valued solution for delivering precise and smooth flow in research, pilot plants and production applications.

KD Scientific is Recognized Worldwide for:

- Quality, accuracy and reliability at economical prices
- A broad line of syringe pumps from the most basic to advanced programmable pumps
- A commitment to delivering the highest level of customer satisfaction & technical support

The KD Scientific Advantage:

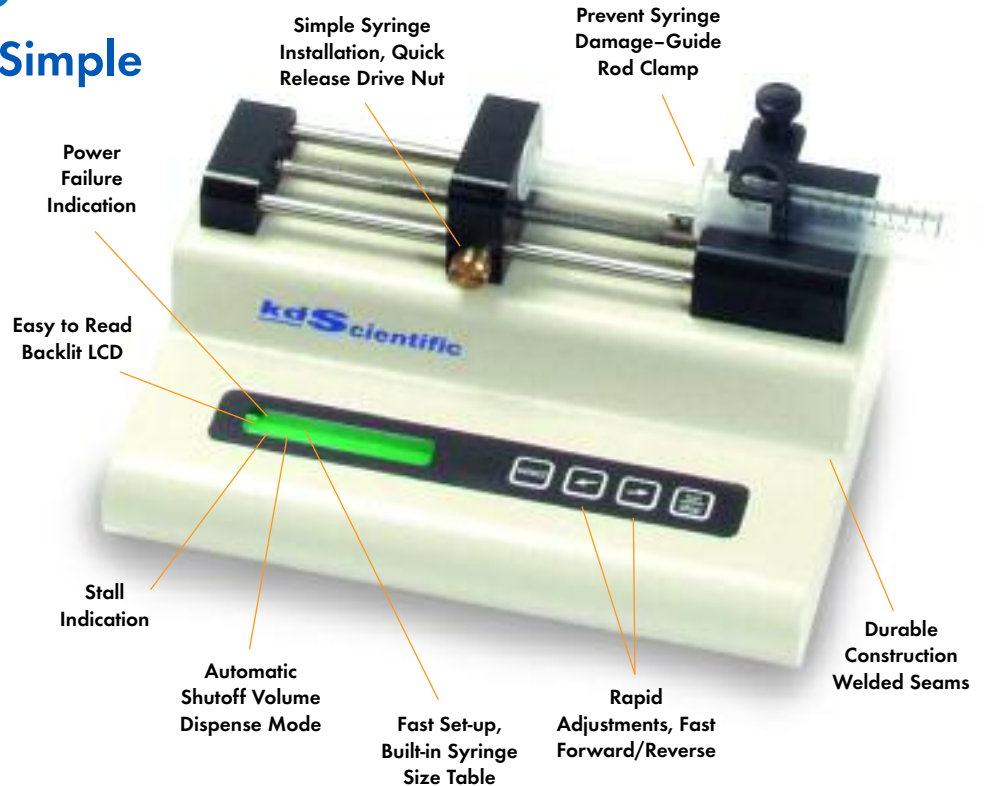
- High precision flow delivery for maximum reproducibility
- Pulseless Flow – great for pulse sensitive applications
- Easy to Use – menu driven set up
- Remote Control – interface to computer/foot pedal/valves
- Reliable – thousands of units in operation worldwide with performance you can count on
- 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!

KDS 100 Series



KDS 200 Series

All the features of a KDS 100 plus...



Infusion Pumps

INFUSION PUMPS

KD SCIENTIFIC INFUSION PUMPS ARE IDEAL FOR DELIVERING ACCURATE AND PRECISE AMOUNTS OF FLUIDS FOR A MULTITUDE OF APPLICATIONS INCLUDING INJECTION OF CALBRANT INTO A MASS SPECTROMETER OR REACTION CHAMBER, LONG TERM DRUG DELIVERY TO ANIMALS AND GENERAL INFUSION APPLICATIONS. CUSTOMERS USE THE KDS 100 / KDS 200 SYRINGE PUMPS MORE THAN ANY OTHER FOR THEIR OUTSTANDING RELIABILITY AND PERFORMANCE. THE KDS 100 SERIES PUMPS GIVE CUSTOMERS THE MOST COST EFFECTIVE SOLUTION FOR INFUSING FLUIDS. ALTERNATIVELY, THE KDS 200 SERIES GIVES THE CUSTOMERS ADVANCED FEATURES WITH RS232 AND TTL INTERFACES. ALL KDS 200 SERIES PUMPS CAN BE DAISY CHAINED TOGETHER TO CREATE A PUMPING NETWORK.



KDS 100 Single-Syringe Infusion Pump

This inexpensive Single Syringe Infusion Pump combines precision and simplicity with outstanding ease of use and exceptional durability.

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

KDS 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 0.001 µl/hr with 10 µl syringe
- Holds one or two syringes, 10 µl to 140 ml each



KDS 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 10 ml each or, a single syringe up to 60 ml
- Minimum flow 1 nanoliter/hr. (10 ml syringe)



KDS 220 Multi-Syringe Infusion Pump

KDS 220 Multi-Syringe Infusion Pump 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 10 ml
 - One to six syringes, 20 ml - 60 ml
 - One to four syringes, 100 ml - 140 ml



KDS 250 Four-Syringe Nanoliter Infusion Pump

Each syringe can be sized differently and is clamped independently.

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

Infusion/Withdrawal Pumps

INFUSION/WITHDRAWAL PUMPS

INFUSE AND WITHDRAW CAPABILITIES PROVIDE MAXIMUM FLEXIBILITY FOR VARIED APPLICATIONS. THIS FEATURE PERMITS APPLICATIONS SUCH AS AUTOMATIC WITHDRAWAL OF SAMPLES AND UNATTENDED FILLING OF SYRINGES AT VERY LOW FLOW RATES. THE UNIQUE KDS 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 KDS 310 ON A STEREOTAXIC MANIPULATORS WITHOUT THE NEED FOR LONG NARROW TUBING WHICH IS BOTH DIFFICULT TO USE AND REQUIRES LARGER VOLUMES OF VALUABLE FLUIDS.



KDS 210 Two-Syringe Infusion/Withdrawal Pump

The KDS 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, 10 ml to 140 ml each
- Multiple mode selection:
 - Infusion, Withdrawal, Infusion then Withdrawal, Withdrawal then Infusion, Continuous Cycle

NEW

KDS 310 Nanoliter Syringe Pump

The KDS 310 Reversible Nano Pump is used exclusively with micro syringes. Small 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 μ l syringe
- Minimum flow of 0.01 μ l/minute



KDS 230 Multi-Syringe Infusion/Withdrawal Pump

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

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



KDS 310-PLUS
Higher Force
Version
Available!



Push-Pull Pumps

PUSH-PULL SYRINGE PUMPS

THESE PROVEN KDS PUMPS PROVIDE SIMULTANEOUS INFUSION AND WITHDRAWAL WITH OPPOSING SYRINGES ON A SINGLE DRIVE. THE KDS 120 AND KDS 260 ARE ADAPTATIONS OF THE KDS 100 AND KDS 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.



KDS 260 Four-Syringe Push-Pull Pump

This KDS pump provides simultaneous infusion and withdrawal with opposing syringes on a single drive.

Note: When not used in push/pull mode, the pump has all the features of KDS 210

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



KDS 120 Two-Syringe Push-Pull Pump

This pump provides simultaneous infusion and withdrawal at the same rate with opposing syringes on the same drive screw. The Push/Pull mode is designed for one cycle only.

- Holds two syringes 10 μ l to 10 ml each
- Minimum flow 0.003 μ l/hr (10 μ l syringe)

Continuous Cycle Syringe Pump



KDS 270 Continuous Cycle Syringe Pump

(Formerly KDS 210C)

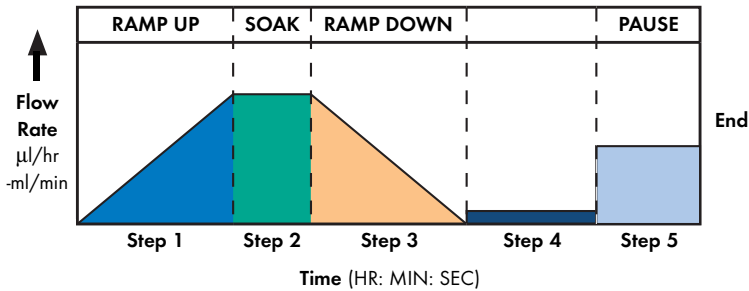
The KDS 270 can hold up to four syringes and can cycle continuously back and forth in a push-pull action. As two syringes are infusing, two syringes are withdrawing at the same rate. At the end of the set volume the direction is automatically reversed and the next cycle begins. With the use of 3-way valves, the pump can empty and refill syringes for a continuous dispense.

- Holds four syringes, 10 ml to 60 ml each. With larger syringes the full volume may not be useable. [60 ml syr - 40 ml useable, 30 ml syr - full]

Keypad Programmable Pumps

Keypad programmable option now available with all KDS 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. KDS pumps provide a smooth, linear transition automatically.

A program is divided into eight variable time periods called 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 ($\mu\text{l/hr}$ to ml/min range)
4. End flow rate ($\mu\text{l/hr}$ 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 separate loops available.
8. Set the count in the loop cycle. Steps may be repeated up to 100 times.
9. Program stored in non volatile memory.

Specialty Pump



NEW

KDS 330 Emulsifier Pump

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

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

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

- Simple control using a keypad, menu selection and a LCD display
- Volume setting and automatic cycling
- Rate setting
- Settings stored in memory
- Stall detection

Accessories



Footswitch

Remotely start/stop the KDS 200 series pumps with this footswitch. Plugs directly to the TTL interface on the KD 200 series of pumps.

Daisy Chain Cable

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

RS232 Cable

9 pin female connector with phone jack interface to KDS 200 series pumps.

Pump Specifications (All pumps available in CE mark version)

Infusion Pumps					
Model	KDS 100	KDS 101	KDS 200	KDS 220	KDS 250
Syringes Max. No. and Size	One 10 µl - 60 ml each	Two 10 µl - 10 ml each	Two 10 µl - 140 ml each	Ten 10 µl - 10 ml each Six 20 ml - 60 ml each Four 100 ml - 140 ml each	Four 10 µl - 10 ml each (each syringe can be a different size)
Dimensions	9 x 6 x 5 in (23 x 15 x 12 cm)	9 x 6 x 5 in (23 x 15 x 12 cm)	11 x 9 x 6 in (28 x 23 x 15 cm)	11 x 12 x 6 in (28 x 23 x 15 cm)	11 x 9 x 6 in (28 x 23 x 15 cm)
Weight	4.5 lb (2 kg)	5 lb (2.3 kg)	9 lb (4 kg)	9.5 lb (4.3 kg)	9 lb (4 kg)
Min. Flow Rate (10 µl syrl)	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 60 ml syringe 140 ml syringe	127 ml/hr 519 ml/hr -	0.351 ml/min - -	21 ml/min 86 ml/min 145 ml/min	21 ml/min - -	21 ml/min - -
Linear Force	20 lb (9 kg)	40 lb (18 kg)	40 lb (18 kg)	40 lb (18 kg)	40 lb (18 kg)
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)	1/30sec	1/30sec	1/100sec	1/100sec	1/100sec
Accuracy	± < 1%	± < 1%	± < 1%	± < 1%	± < 1%
Reproducibility	± 0.1%	± 0.1%	± 0.1%	± 0.1%	± 0.1%
Programmable Model	-	-	KDS 200P	KDS 220P	KDS 250P

	Infusion/Withdrawal Pumps			Push-Pull Pumps		Continuous Flow
Model	KDS 210	KDS 230	KDS 310	KDS 120	KDS 260	KDS 270
Syringes Max. No. and Size	Two 10 µl - 140 ml each	Ten 10 µl - 10 ml each Six 20 ml - 60 ml each Four 100 ml - 140 ml each	One 1 µl - 100 µl	One + One 10 µl - 15 ml each	Two + Two 10 µl - 60 ml each	Up to Four 10 µl to 60 ml
Dimensions	11 x 9 x 6 in (28 x 23 x 15 cm)	11 x 9 x 6 in (28 x 23 x 15 cm)	7 x 1 x 2 in (17 x 3 x 5 cm)*	9 x 6 x 6 in (23 x 15 x 14 cm)	11 x 9 x 6 in (28 x 23 x 15 cm)	11 x 9 x 6 in (28 x 23 x 15 cm)
Weight	9 lb (4 kg)	9.5 lb (4.3 kg)	4 lb (2 kg)	5 lb (2.3 kg)	9.5 lb (4.3 kg)	9.5 lb (4.3 kg)
Min. Flow Rate (10 µl syrl)	0.001 µl/hr	0.001 µl/hr	0.01 µl/min**	0.1 µl/hr	0.001 µl/hr	0.001 µl/hr
Max. Flow Rate 10 ml syringe 60 ml syringe 140 ml syringe	21 ml/min 86 ml/min 145 ml/min	21 ml/min - -	127.1 µl/min (100 µl syringe) - -	127 ml/hr - -	21 ml/min 86 ml/min -	21 ml/min 86 ml/min (30 ml) -
Linear Force	40 lb (18 kg)	40 lb (18 kg)	10 oz (0.28 kg)	20 lb (9 kg)	40 lb (18 kg)	40 lb (18kg)
Advance per Microstep	0.165 micron (1/16 step)	0.165 micron (1/16 step)	6.35 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	400/sec	400/sec	1600/sec	1600/sec
Min. Step Rate (1/2 Step)	1/100sec	1/100sec	1/30sec	1/30sec	1/100sec	1/100sec
Accuracy	± < 1%	± < 1%	± < 1%	± < 1%	± < 1%	± < 1%
Reproducibility	± 0.1%	± 0.1%	± 0.1%	± 0.1%	± 0.1%	± 0.1%
Programmable Model	KDS 210P	KDS 230P	-	-	KDS 260P	KDS 270P

Audible alarm option available with all pumps. Keypad programmable option available with all 200 Series pumps.

NOTE: KD SCIENTIFIC SYRINGE PUMPS ARE FOR LABORATORY USE ONLY. THEY HAVE NOT BEEN APPROVED BY THE FDA FOR CLINICAL USE ON HUMANS.

All models available 115/230 VAC 50/60 Hz and with CE mark. All specifications subject to change at any time.

* Pump head dimensions. ** Using 1 µl syringe.

PUMPS WITH A PURPOSE.

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