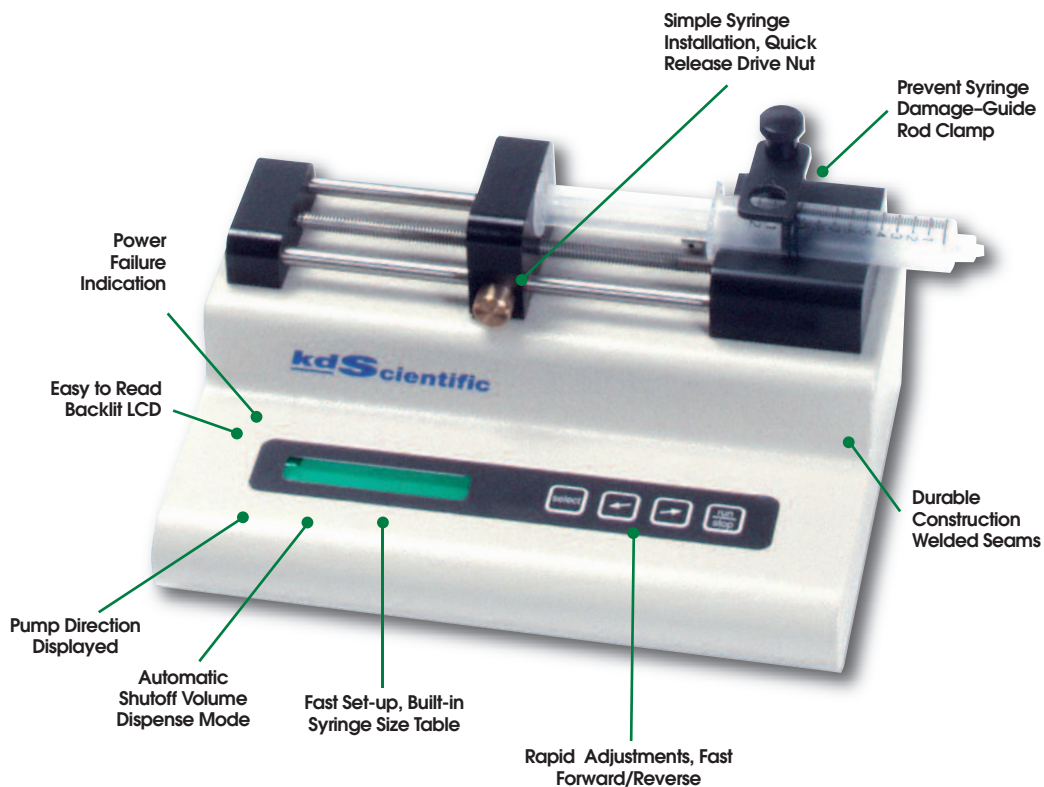


The Legacy series is the foundation for all KD Scientific Pumps. The Legacy pumps are acknowledged as the industry's highest valued solution for delivering precise and smooth flow in research, pilot plants and production applications. Simple and easy to use, these pumps are the favorite of research scientists and engineers. They 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/KDS 400 series give the customer advanced features with RS232 and TTL interfaces. All KDS 200/KDS 400 series pumps can be daisy chained together to create a pumping network.

The KDS Legacy Series



General Features Available on ALL Legacy pumps:

- Vibration Elimination System
- Flow Direction Indicator
- Fast Forward/Reverse
- Antisiphon Clamp (I/W Models only)
- CE Approved Model 100 series are ETL listed and conforms to ANSI/UL Standard 61010-1:2004 2ND ED. Certified to CAN/CSA STD C22.2NO.61010.1:2004 2ND ED
- Power Recovery Diagnostics
- Optional Foot Pedal Interface
- NIST Certificate Option
- Alarm Option
- CE Approved Models

Basic Programming

- Syringe Library
- Flow Rate Selection
- Volume Dispense Mode
- Direct Entry Syringe Diameter

Standard on KDS 200/KDS 400 Pumps

- Daisy Chain Connection
- RS232
- TTL
- Foot Switch Interface Standard
- Stall Detection
- Numeric Keypad
- Engineering Unit Selection

Expanded Capabilities

Network Multiple Pumps

Network up to 100 Pumps—Mix and Match any KDS 200/400 Series Pump!

All KDS 200/400 series pumps can be networked together. Each pump has a unique address to control its rate and volume remotely from a computer. Pump start/stop activation can be easily controlled. National Instruments certified Labview™ drivers are available at no charge.

Advanced Programmable Pumps

Keypad programmable option now available with all KDS 200/KDS 400 Series syringe pumps. Lets you program right from the keypad with software program on computer.

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.

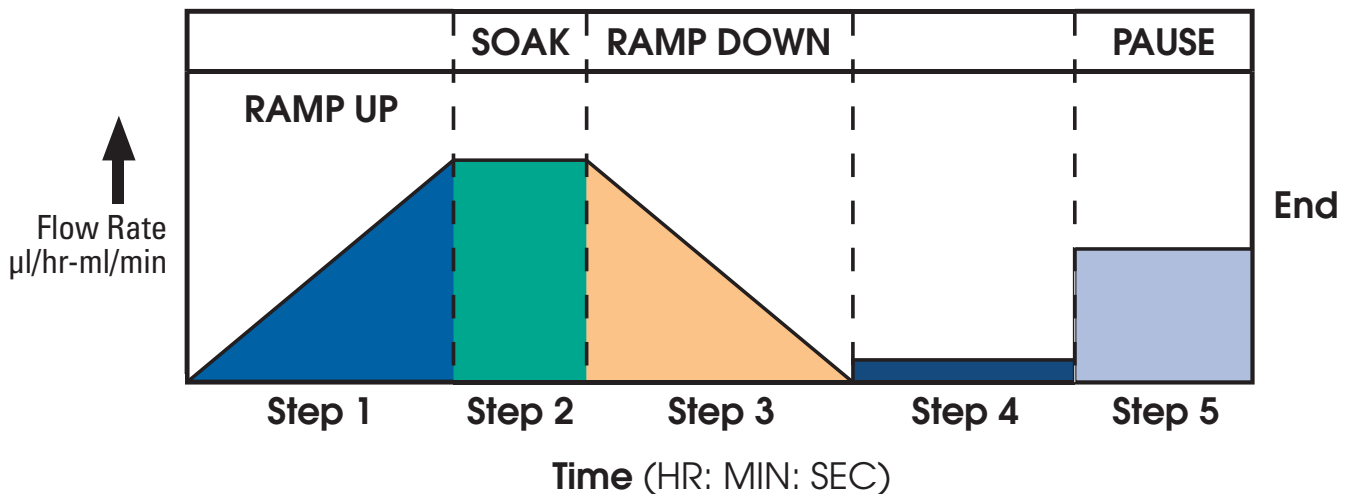
A program is divided into eight variable time periods called steps. A step can be up to 12 hours long and may be changed without affecting other steps.

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 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.



LEGACY SERIES



KD Scientific 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.

Infusion Pumps



KDS 100
Single-Syringe
Infusion Pump



KDS 200
Two-Syringe
Infusion Pump



KDS 101
Two-Syringe
Nanoliter Pump



KDS 220
Multi-Syringe
Infusion Pump



KDS 250
Four-Syringe Microliter
Infusion Pump

KDS 100

Single-Syringe Infusion Pump

This economical Single Syringe Infusion Pump combines precision flow with outstanding ease-of-use and exceptional durability.

- Single syringe 10 μ l to 60 ml
- Wide flow range up to 423 ml/hr (60 ml syringe)

KDS 101

Two-Syringe Nanoliter Pump

The KDS 101 Two-Syringe Nanoliter Pump is ideal for microdialysis and similar applications which require virtually pulseless flow at very low flow rates.

- Holds 2 syringes, 10 μ l to 10 ml each
- Minimum flow 0.001 μ l/min (10 μ l syringe)

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 μ l/hr with 10 μ l syringe
- Holds one or two syringes, 10 μ l to 140 ml each

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, 10 μ l to 10 ml
 - One to six syringes, 20 ml to 60 ml
 - One to four syringes, 100 ml to 140 ml

KDS 250

Four-Syringe Microliter Infusion Pump

Each syringe can be sized differently and is clamped independently.

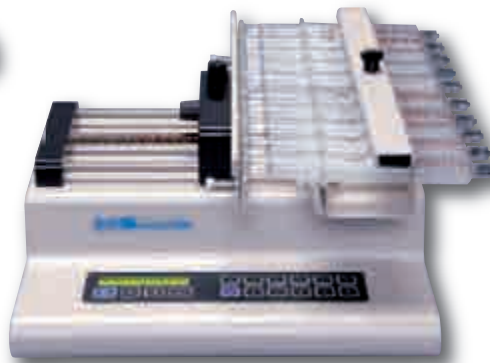
- **Multiple syringe holder**
 - Four syringes, 10 μ l to 10 ml each
- **Separate clamping accommodates various sizes**
- **Syringes may be positioned independently for sequential dispensing by the pusher block.**

Infusion/Withdrawal Pumps

Infuse and withdraw capabilities provide maximum flexibility for varied applications. This feature 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 manipulator 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



KDS 230
Multi-Syringe
Infusion/Withdrawal Pump



KDS 310
Single Syringe
Nanoliter Pump



Note: Stereotaxic frame for illustration only.

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 μ l to 140 ml each
- Multiple mode selection:
 - Infusion, Withdrawal, Infusion then withdrawal, Withdrawal then Infusion, Continuous Cycle

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, 10 μ l to 10 ml
 - One to six syringes, 20 ml to 60 ml
 - One to four syringes, 100 ml to 140 ml
- Multiple mode selection:
 - Infusion, Withdrawal, Infusion then withdrawal, Withdrawal then Infusion, Continuous Cycle

KDS 310 Plus

Single-Syringe Nanoliter Pump

The KDS 310 Plus Single-Syringe Nanoliter Pump is used exclusively with micro syringes. Small size, remote pump head and a rugged mounting arm make it ideal for use with a micromanipulator, stereotaxic frame and other clamping devices.

- Mini size pump
- Remote pump head
- 0.5 μ l to 250 μ l syringe
- Minimum flow of 0.001 μ l/min (0.5 μ l syringe)

KD Scientific specialty pumps are engineered to meet the demands of specific applications. These pumps use the basic design of our standard pumps but are modified to provide specific functionality for any application.

The Legacy Series fits your

KDS 120
Two-Syringe
Push-Pull Pump



KDS 260
Four-Syringe
Push-Pull Pump



KDS 270
Continuous Cycle
Syringe Pump



KDS 410
High Pressure
Syringe Pump



KDS 120

Two-Syringe Nanoliter 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 µl to 10 ml each
- Minimum flow 0.1 µl/hr (10 µl syringe)

KDS 260

Four-Syringe Push-Pull Pump

This KDS 260 pump provides simultaneous infusion and withdrawal with opposing syringes on a single drive. This is a single cycle pump (due to brackets).

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

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

KDS 270

Continuous Cycle Syringe Pump

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 µl to 60 ml each. With large syringes the full volume may not be useable. (60 ml syringe - 40 ml useable, 30 ml syringe - full)

KDS 410

High Pressure Syringe Pump

The KDS 410 is ideal for delivering fluid to reactors in chemical applications or for working with viscous fluids. The robust design ensures the syringe is kept level during delivery of the fluid. The KDS 410 more than doubles the linear force available in the KDS 200 series.

- Single syringe 10 µl to 140 ml
- Minimum flow 0.001 µl/hr with a 10 µl syringe
- > 100 lbs (45 kg) linear force

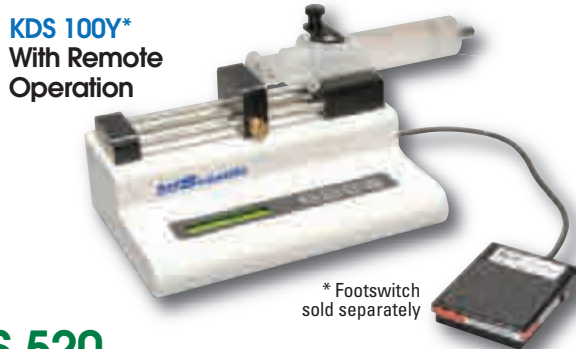
Everyday Applications



KDS 520
Volume Dispense System



KDS 510
Dual Rate Pump System



KDS 100Y*
With Remote Operation

* Footswitch sold separately

KDS 100L
With LED Indication



KDS 520 Volume Dispense System

Sequential volume dispensing is easy with the new volume dispensing system. The system includes two KDS 100 pumps and the cable to link the pumps together. Set the same or different volume[s] in pump A and B; pump A will dispense the predetermined volume and start pump B automatically. Pump A and B can have unique flow rates. The two pumps can also be operated as standard independent KDS 100's.

KDS 510 Dual Rate Pump System

Activate two KDS 100 pumps simultaneously with one push of the start key. Set each pump with a different flow rate and the pumps will infuse at the same time. The system includes two KDS 100 pumps and the cable to link the pumps together. The two pumps can also be operated as standard independent KDS 100's.

KDS 100Y with Remote Operation

A new version of the rugged KDS 100 can now be remotely triggered with a footswitch or external switch. Starting and stopping dispense or infusion can be automated or remotely activated.

Also Available: 101Y, 120Y, 310Y

KDS 100L with LED Indication

The KDS 100 is now available with an optional LED to indicate the pump is on or running. This feature is ideal to get a quick indication if the pump is dispensing, especially if multiple pumps are in operation.

Also Available: 101L, 120L, 310L

The KDS 100 series has been modified with new hardware and software features for specific applications. Integrating multiple pumps in a system allows the individual pumps to interact with other ones. This will provide a system linked together based on information from one pump being transferred to another.

In addition, new features have been added to the KDS 100 Series including a new remote interface or an LED on the pump to indicate it is running. Contact KD Scientific for more information on other requirements you have for your specific applications.

Legacy Series Specifications

Legacy Model	Infuse Only Pumps						
	KDS 100	KDS 100L	KDS 100Y	KDS 101	KDS 200	KDS 220	KDS 250
Order Code 110 VAC	78-0100	78-0100ZZ	78-0100Y	78-0101	78-0200	78-0220	78-0250
Order Code 220 VAC	78-1100	78-1100ZZ	78-1100Y	78-1101	78-1200	78-1220	78-1250
Order Code 220 VAC with CE Mark	78-9100	78-9100ZZ	78-9100Y	78-9101	78-9200	78-9220	78-9250
Mode	Infuse	Infuse	Infuse	Infuse	Infuse	Infuse	Infuse
# Syringes	One	One	One	Two	Two	10 Maximum	Four
Syringe Size	10 µl to 60 ml	10 µl to 60 ml	10 µl to 60 ml	10 µl to 10 ml	10 µl to 140 ml	10 µl to 10 ml (up to 10) 40 ml to 60 ml (up to 6) 100 ml to 140 ml (up to 4)	10 µl to 10 ml
User Interface	Keypad	Keypad	Keypad	Keypad	Keypad with numerics	Keypad with numerics	Keypad with numerics
Display	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD
Accuracy	+/-<1%	+/-<1%	+/-<1%	+/-<1%	+/-<1%	+/-<1%	+/-<1%
Repeatability	+/-0.1%	+/-0.1%	+/-0.1%	+/-0.1%	+/-0.1%	+/-0.1%	+/-0.1%
Linear Force	20 lb/9 kg	20 lb/9 kg	20 lb/9 kg	40 lb/18 kg	40 lb/18 kg	40 lb/18 kg	40 lb/18 kg
Force Adjustment	-	-	-	-	-	-	-
Minimum Flow Rate 10 µl syringe	0.1 µl/hr	0.1 µl/hr	0.1 µl/hr	0.001 µl/min	0.001 µl/hr	0.001 µl/hr	0.001 µl/hr
Maximum Flow Rate 10 ml syringe	127 ml/hr	127 ml/hr	127 ml/hr	0.351 ml/min	1270 ml/hr	1270 ml/hr	1270 ml/hr
Maximum Flow Rate 60 ml syringe	423 ml/hr	423 ml/hr	423 ml/hr	-	4235 ml/hr	4235 ml/hr	-
Maximum Flow Rate 140 ml syringe	-	-	-	-	8824 ml/hr	8824 ml/hr	-
Drive Motor	7.5' Stepper Motor	7.5' Stepper Motor	7.5' Stepper Motor	7.5' Stepper Motor	1.8' Stepper Motor	1.8' Stepper Motor	1.8' Stepper Motor
Motor Gearbox	25:1	25:1	25:1	150:1	N/A	N/A	N/A
Microprocessor Motor Drive Control	1/2 microstepping	1/2 microstepping	1/2 microstepping	1/2 microstepping	1/16 microstepping	1/16 microstepping	1/16 microstepping
# microsteps/one revolution of lead screw	2400	2400	2400	14400	6400	6400	6400
Advance per Microstep	0.529 µm	0.529 µm	0.529 µm	0.088 µm	0.1654 µm	0.1654 µm	0.1654 µm
Minimum Step Rate	30 sec/µstep	30 sec/µstep	30 sec/µstep	30 sec/µstep	120 sec/µstep	120 sec/µstep	120 sec/µstep
Maximum Step Rate	0.0025 sec/µstep	0.0025 sec/µstep	0.0025 sec/µstep	0.0025 sec/µstep	0.000625 sec/µstep	0.000625 sec/µstep	0.000625 sec/µstep
Pusher Travel Rate							
Minimum	0.10583 µm/min	0.10583 µm/min	0.10583 µm/min	0.001767 µm/min	0.10583 µm/min	0.10583 µm/min	0.10583 µm/min
Maximum	12700 µm/min	12700 µm/min	12700 µm/min	2033 µm/min	126900 µm/min	126900 µm/min	126900 µm/min
Multi-step Programming	No	No	No	No	Programmable Model	Programmable Model	Programmable Model
Pusher Block Stall Detection	No	No	No	No	Yes	Yes	Yes
Computer Interface	No	No	No	No	RS-232	RS-232	RS-232
TTL	No	No	No	No	Yes	Yes	Yes
Networking (Daisy-chain)	No	No	No	No	Yes	Yes	Yes
Audible Alarm Indication							
End of Run	Optional	Yes	Optional	Optional	Optional	Optional	Optional
Run LED	No	Yes	No	No	No	No	No
Power Domestic	100 ~ 120 VAC 50/60Hz	100 ~ 120 VAC 50/60Hz	100 ~ 120 VAC 50/60Hz	100 ~ 120 VAC 50/60Hz	100 ~ 120 VAC 50/60Hz	100 ~ 120 VAC 50/60Hz	100 ~ 120 VAC 50/60Hz
Power CE and International	200 ~ 240 VAC, 50/60Hz	200 ~ 240 VAC, 50/60Hz	200 ~ 240 VAC, 50/60Hz	200 ~ 240 VAC, 50/60Hz	200 ~ 240 VAC, 50/60Hz	200 ~ 240 VAC, 50/60Hz	200 ~ 240 VAC, 50/60Hz
Weight	4.5 lb/2 kg	4.5 lb/2 kg	4.5 lb/2 kg	4.5 lb/2 kg	9.5 lb/4 kg	9.5 lb/4 kg	9.5 lb/4 kg
Dimensions (in)	9 X 6 x 5	9 X 6 x 5	9 X 6 x 5	9 X 6 x 5	11 x 9 x 5.5	11 x 9 x 5.5	11 x 9 x 5.5
Dimensions (cm)	23 x 15.25 x 13	23 x 15.25 x 13	23 x 15.25 x 13	23 x 15.25 x 13	28 x 23.5 x 14	28 x 23.5 x 14	28 x 23.5 x 14
Certifications							
CE, ETL, UL, CSA, CB Scheme	CE Model	CE Model	CE Model	CE Model	CE Only (no ETL)	CE Only (no ETL)	CE Only (no ETL)
EN 61010, EN 61326							
WEEE (just WEEE - not RoHS)	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant
Programmable Model	N/A	N/A	N/A	N/A	KDS 200P	KDS 220P	KDS 250P
Order Code 110 VAC					78-0202	78-0222	78-0252
Order Code 220 VAC					78-1202	78-1222	78-1252
Order Code 220 VAC with CE Mark					78-9202	78-9222	78-9252

Infuse/Withdraw Pumps		Push/Pull Pumps		Continuous Pump	High Pressure Pump	Remote Injector Pump
KDS 210	KDS 230	KDS 120	KDS 260	KDS 270	KDS 410	KDS 310 Plus
78-0210	78-0230	78-0120	78-0260	78-0270	78-0410	78-0311
78-1210	78-1230	78-1120	78-1260	78-1270	78-1410	78-1311
78-9210	78-9230	78-9120	78-9260	78-9270	78-9410	78-9311
Infuse/Withdraw	Infuse/Withdraw	Push/Pull	Push/Pull	Infuse/Withdraw/Continuous	Infuse/Withdraw	Infuse/Withdraw
Two	10 Maximum	One and One	Two and Two	Two and Two (Four total)	One	One
10 µl to 140 ml	10 µl to 10 ml (up to 10) 40 ml to 60 ml (up to 6) 100 ml to 140 ml (up to 4)	10 µl 10 ml	10 µl to 60 ml	10 µl to 60 ml (up to 4)	10 µl to 140 ml	0.5 µl to 250 µl
Keypad with numerics	Keypad with numerics	Keypad	Keypad with numerics	Keypad with numerics	Keypad with numerics	Keypad
Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD	Backlit LCD
+/-<1%	+/-<1%	+/-<1%	+/-<1%	+/-<1%	+/-<1%	+/-<1%
+/-0.1%	+/-0.1%	+/-0.1%	+/-0.1%	+/-0.1%	+/-0.1%	+/-0.1%
40 lb/18 kg	40 lb/18 kg	20 lb/9 kg	40 lb/18 kg	40 lb/18 kg	>100 lb/45 kg	2 lb/ 0.9kg
-	-	-	-	-	-	-
0.001 µl/hr	0.001 µl/hr	0.1 µl/hr	0.001 µl/hr	0.001 µl/hr	-	145.6 µl/min (100 µl syr)
1270 ml/hr	1270 ml/hr	127 ml/hr	1270 ml/hr	1270 ml/hr	1270 ml/hr	-
4235 ml/hr	4235 ml/hr	423 ml/hr	4235 ml/hr	4235 ml/hr	4235 ml/hr	-
8824 ml/hr	8824 ml/hr	-	8824 ml/hr	8824 ml/hr	8824 ml/hr	-
1.8' Stepper Motor	1.8' Stepper Motor	7.5' Stepper Motor	1.8' Stepper Motor	1.8' Stepper Motor	1.8' Stepper Motor	-
n/a	n/a	25:1	N/A	N/A	N/A	N/A
1/16 microstepping	1/16 microstepping	1/2 microstepping	1/16 microstepping	1/16 microstepping	1/16 microstepping	-
6400	6400	2400	6400	6400	6400	-
0.1654 µm	0.1654 µm	0.529 µm	0.1654 µm	0.1654 µm	0.1654 µm	1.58 µm
120 sec/µstep	120 sec/µstep	30 sec/µstep	120 sec/µstep	120 sec/µstep	120 sec/µstep	-
0.000625 sec/µstep	0.000625 sec/µstep	0.0025 sec/µstep	0.000625 sec/µstep	0.000625 sec/µstep	0.000625 sec/µstep	-
-	-	-	-	-	-	-
0.10583 µm/min	0.10583 µm/min	0.10583 µm/min	0.10583 µm/min	0.10583 µm/min	0.10583 µm/min	-
126900 µm/min	126900 µm/min	12700 µm/min	126900 µm/min	126900 µm/min	126900 µm/min	-
Programmable Model	Programmable Model	No	Programmable Model	Programmable Model	Programmable Model	No
Yes	Yes	No	Yes	Yes	Yes	No
RS-232	RS-232	No	RS-232	RS-232	RS-232	No
Yes	Yes	No	Yes	Yes	Yes	No
Yes	Yes	No	Yes	Yes	Yes	No
Optional	Optional	Optional	Optional	Optional	Optional	Optional
No	No	No	No	No	No	No
100 ~ 120 VAC 50/60Hz	100 ~ 120 VAC 50/60Hz	100 ~ 120 VAC 50/60Hz	100 ~ 120 VAC 50/60Hz	100 ~ 120 VAC 50/60Hz	100 ~ 120 VAC 50/60Hz	100 ~ 120 VAC 50/60Hz
200 ~ 240 VAC, 50/60Hz	200 ~ 240 VAC, 50/60Hz	200 ~ 240 VAC, 50/60Hz	200 ~ 240 VAC, 50/60Hz	200 ~ 240 VAC, 50/60Hz	200 ~ 240 VAC, 50/60Hz	200 ~ 240 VAC, 50/60Hz
9.5 lb/4 kg	9.5 lb/4 kg	4.5 lb/2 kg	9.5 lb/4 kg	9.5 lb/4 kg	14.1 lb/6.4 kg	4.5 lb/2 kg
11 x 9 x 5.5	11 x 9 x 5.5	9 X 6 x 5	11 x 9 x 5.5	11 x 9 x 5.5	6 x 11 x 9.5	7 X 1.7 x 2
28 x 23.5 x 14	28 x 23.5 x 14	23 x 15.25 x 13	28 x 23.5 x 14	28 x 23.5 x 14	15 x 28 x 24	17.8 x 4.4 x 5.1
CE Only (no ETL)	CE Only (no ETL)	CE Model	CE Only (no ETL)	CE Only (no ETL)	CE Only (no ETL)	CE Model
Compliant	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant
KDS 210P	KDS 230P	N/A	KDS 260P	KDS 270P	KDS 410 P	
78-0212	78-0232		78-0262	78-0272	78-0412	
78-1212	78-1232		78-1262	78-1272	78-1412	
78-9212	78-9232		78-9262	78-9272	78-9412	