

## ReciPro<sup>®</sup> Liquid Metering Pumps

- *Reproducible flow rates*
- *High pressure capabilities*
- *Corrosion resistant*
- *Remote control options*



### Eldex metering pumps

can be used wherever precise flow rate control, particularly at high pressures, is required.

We manufacture a wide range of Recipro pumps grouped into three different pump families; the HP Series, the Duros® Series, and the VS Series. We can customize our designs to meet your specific requirements.

All Eldex Recipro metering pumps are based on a positive displacement, reciprocating piston design, which gives you precise flow control.

Eldex Recipro pumps are capable of flow rates ranging from 0.02 to 144 mL/min, at pressures up to 5000 psi. Our Recipro products include single piston pumps (A, B, or CC), dual piston pumps (AA or BB), and triple piston pumps (BBB).

Pumps with multiple pistons have their channels out of phase for minimized pulsation, and can be operated either independently, or, with the use of a manifold, in parallel.

Recipro pumps are designed for, and ideally suited to, the following applications:

- HPLC
- Column washing
- Post column reaction
- Column testing
- Pilot plant
- Reactant feed
- Flow Injection Analysis

### Reproducible metering

Precise metering at high pressure is attained by a positive displacement, reciprocating piston assembly. The piston is driven by a constant speed motor via a specially contoured cam. The cam profile is designed so the piston rapidly intakes and delivers a smooth, constant volume of fluid to the end of the piston stroke. Thus, motor efficiency is maximized and pulsation minimized.

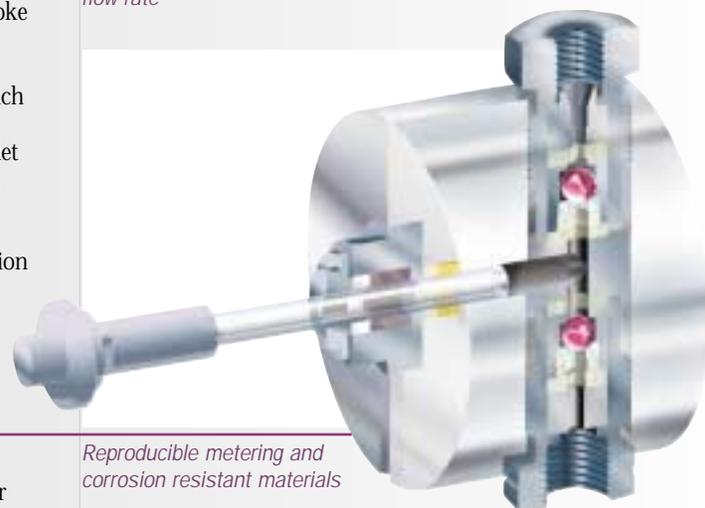


### Micrometer control

Reproducible metering is attained by precise control of the piston's stroke length and rapid response check valves. The piston's stroke length is fixed by a precision micrometer which is simple to use and assures reproducible metering. The inlet and outlet check valves regulate flow direction.

*Micrometer precisely controls flow rate*

The piston assembly is uniquely designed to permit an even application of the force driving the piston—a detail which helps to ensure exact, reliable liquid transfer and extended seal life.



*Reproducible metering and corrosion resistant materials*

### Corrosion resistance

The materials in the liquid end of Eldex pumps are carefully chosen for corrosion resistance. The piston is sapphire, and the inlet and outlet valves incorporate sapphire seats and ruby balls.

The standard piston seal material is an ultra-high molecular weight polyethylene with excellent chemical compatibility characteristics. For specialized applications, a graphite fiber reinforced PTFE seal may be substituted.

The liquid end housing is made of type 316 stainless steel because of its superior resistance to corrosion. In applications requiring the use of extremely corrosive materials, Kel-F® or PEEK® versions of the liquid ends are available.

*Wide range of models in the HP Series for specific flow and pressure requirements.*

### Reliable Design

The compact pump housing, unique piston assembly and many other features demonstrate our dedication to building precision metering pumps made to last. We know they last because users all over the world tell us time and again that their Eldex pumps are still performing after years of continuous use.



## Duros Series

The Duros Series of metering pumps from Eldex combines the low price of a mechanically controlled pump with the performance and convenience of much more expensive pumps.

### Precision

Duros Series pumps produce precise metering because they use the same mechanical principle of a reciprocating piston as our HP Series. And, like other Eldex pumps, the Duros Series minimizes unswept volumes by always displacing to the end of the piston's cylinder, even when operating at less than full stroke length.

### Smooth flow

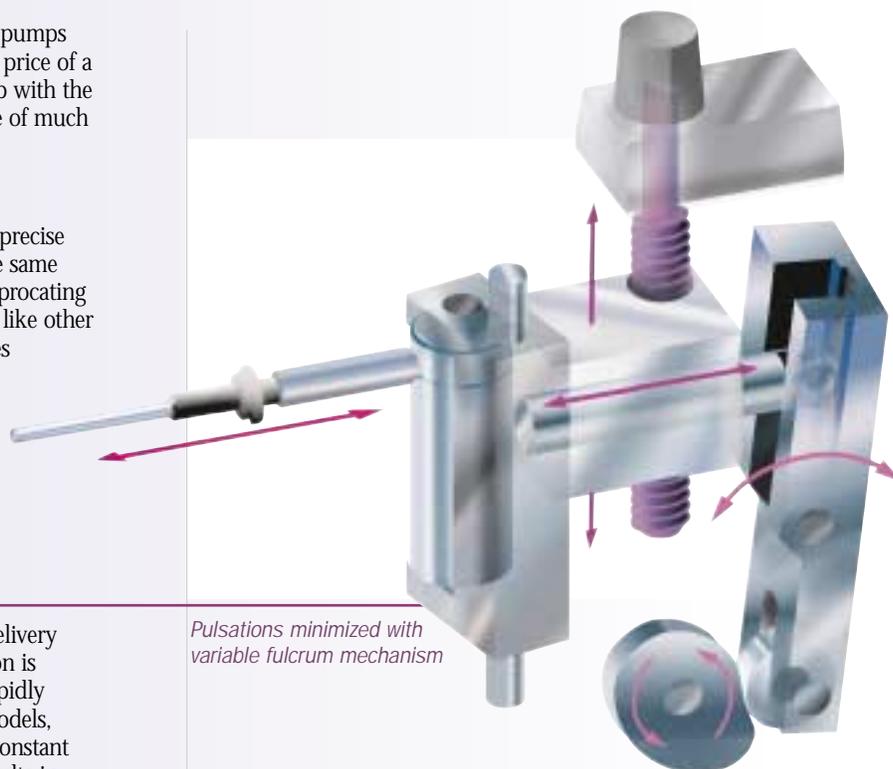
Duros pumps have smooth delivery at all flow rates. Flow pulsation is minimized by both a more rapidly refilling cam than on other models, and by a specially designed, constant motion mechanism which results in smooth flow at all flow rates.

### Direct dial

Flow rates are set directly in mL/min. Metering pumps in this price range usually use either imprecise dial mechanisms, which are all but impossible to reset precisely, or micrometers, which, although precise, require calculations to set a flow rate. The direct dial in the Duros Series can be precisely reset and is easy to use.

### Robust construction

Like all Eldex pumps, Duros pumps are built to last. A cast housing and precision mechanical assembly result in a rugged pump designed to provide long-term service. Wetted parts are carefully chosen for their corrosion resistance, and metal-free configurations are also available.



*Pulsations minimized with variable fulcrum mechanism*

*Direct dial for precise flow rate control*



*The Duros Series offers the performance and convenience of much more expensive pumps.*



## VS Series

### Remote Control

Eldex VS Series pumps provide the convenience of remote control operation without sacrificing the precision and reliability of micrometer or direct dial controlled pumps. All VS Series pumps use the same principle of design as the HP Series.

### Convenient Control Options

The VS Series pumps, which include both a pump and pump controller, have many flexible control options. For local control, a potentiometer on the front panel provides manual flow rate control.

### Input options

For remote control, a controller can precisely set the flow rate by sending one of a wide variety of user selectable voltage or current loop signals. The signal is sent from your controller to the two position terminal block (input signal and ground connection) on the rear panel of the pump controller and sets the pump's motor speed.

Even broader flow rate ranges are available with the addition of an optional precision micrometer, which provides for variation of the piston's stroke length. The VS Series pumps are an ideal, inexpensive solution to OEM, process control and chromatography solvent delivery requirements.

### Durable Design

VS Series pumps utilize a unique technology which allows us to vary the speed of reliable AC synchronous motors, the same type of motors which provide years of service to our HP or Duros metering pumps.

The wetted materials are carefully chosen for corrosion resistance, using the same materials and options available on our HP and Duros pumps.

*Several remote control options for setting flow rate*



*Eldex VS Series pumps provide the convenience of remote control operation*



## Options

### Non-Metallic

Most ReciPro metering pumps can be made with either Kel-F® or PEEK® liquid end assemblies, eliminating type 316 stainless steel as a material of contact. The only metal contacted in Kel-F based pumps is gold, while PEEK based pumps do not have any metallic parts in the fluid path.



### Piston Wash

Designed to be added to any 1/8" piston ReciPro pump, the optional piston wash system can significantly enhance piston seal life.

The use of buffers or solutions which crystallize when exposed to air can lead to abrasion of the piston seal. The wash system allows you to flush a washing solution behind the piston, thereby preventing crystallization.

### Quick Connect Liquid End Kit

The Quick Connect Kit simplifies removal and installation of the liquid end assembly.

### Plumbing Connections

A variety of plumbing configurations are available so that connecting to your system is easy.

### Explosion Proof

Some models in the HP Series are available with explosion proof motors. Motors meet Class I, Group D requirements.



*Explosion proof motors for hazardous locations*

# Choosing the right Eldex pump

Use this guide to help you find the best pump for your application.

- 1 Decide which of the three families of pumps is best suited to your needs: HP Series, Duros Series, or VS Series.
- 2 Select the voltage your require.
- 3 Select the materials of construction.
- 4 Select a pump you will operate in in the upper range of its capacity.

## Common Specifications

### Wetted Parts:

For 316: type 316 stainless steel, sapphire, ruby, gold, UHMW polyethylene, Kel-F®

For PEEK®: PEEK®, sapphire, ruby, UHMW polyethylene, inert polymers

For Kel-F®: Kel-F®, sapphire, ruby, gold, UHMW polyethylene

**Abbreviations:** Pumps with a “-4” in the model number use 1/4” pistons, all others are 1/8”. Pumps with CE in the model number are CE certified.

**Reproducibility:** typically ±0.3%

**Viscosity Limit:** 500 centipoise

### Tubing Connections:

**Inlet valves:** 1/4”-28 plastic fitting for 1/8” plastic tubing

**Outlet valves:** 10-32 tube nut, ferrule for 1/16” tubing (Kel-F® and PEEK® pumps use 1/4”-28 plastic fittings for inlet and outlet valves; BB and BBB pumps use 1/8” Swagelok® fittings for inlet and outlet valves).

Valves with special fittings available on request.

### VS Control Options\*:

Voltage: 5/10/12/24 VDC

Current Loop: 1-5 or 4-20 mA

\*BB and BBB VS have only 0-10 VDC remote control as standard

### Approximate Dimensions and Weights:

Pump Type	Dimensions (L x W x H inches)	Weight (pounds)
A	8 x 5 x 5	6
B & CC	8 x 8 x 6	11
AA	7 x 11 x 7	11
BBB	13 x 10 x 6	30
VS Controller	8 x 9 x 5	8

## HP SERIES

■ Micrometer control of flow rate

	Voltage 115 VAC				Voltage 230 VAC			
	Flow Rate Range <sup>§</sup> (mL/min)	Max Press. (psi)	Model Number	Order Number	Flow Rate Range <sup>§</sup> (mL/min)	Max Press. (psi)	Model Number	Order Number
<b>316 s/s</b>	0.02 - 0.5	5000	A-10-S	1000				
	0.05 - 1.5	5000	A-30-S	1003	0.05 - 1.5	5000	A-30-S-2 CE	1440
	0.1 - 3.0	2500	A-60-S	1005	0.1 - 3.0	2500	A-60-S-2	1006
	0.2 - 6.0	1000	A-120-S	1384	0.1 - 3.0	2500	A-60-S-2 CE	1441
	0.2 - 8.0	5000	B-100-S	1011	0.2 - 6.0	1000	A-120-S-2	1385
	1.0 - 32.0	2000	B-100-S-4	1013	0.2 - 8.0	5000	B-100-S-2 CE	1442
	0.2 - 6.0	5000	AA-60-S	1474	1.0 - 32.0	2000	B-100-S-4-2 CE	1443
	0.2 - 10.0	5000	AA-100-S	1018	0.2 - 10.0	5000	AA-100-S-2 CE	1444
	1.0 - 100.0	5000	BBB-4	1020	1.0 - 80.0	5000	BBB-4-2	1021
<b>PEEK</b>	0.02 - 0.5	4000	A-10-S-PK	1281				
	0.05 - 1.5	4000	A-30-S-PK	1282	0.05 - 1.5	4000	A-30-S-PK-2 CE	1449
	0.1 - 3.0	2500	A-60-S-PK	1284	0.1 - 3.0	2500	A-60-S-PK-2	1285
	0.2 - 6.0	1000	A-120-S-PK	1289	0.1 - 3.0	2500	A-60-S-PK-2 CE	1450
	0.2 - 8.0	4000	B-100-S-PK	1287	0.2 - 6.0	1000	A-120-S-PK-2	1290
	1.0 - 32.0	2000	B-100-S-4-PK	1307	0.2 - 8.0	4000	B-100-S-PK-2 CE	1451
	0.2 - 6.0	4000	AA-60-S-PK	1475	1.0 - 32.0	2000	B-100-S-4-PK-2 CE	1452
	2.0 - 10.0	4000	AA-100-S-PK	1293	0.2 - 10.0	4000	AA-100-S-PK-2 CE	1453
	<b>Kel-F</b>	0.05 - 1.5	2000	A-30-SF	1128	0.05 - 1.5	2000	A-30-SF-2 CE
0.1 - 3.0		2000	A-60-SF	1129	0.1 - 3.0	2000	A-60-SF-2	1215
0.2 - 6.0		1000	A-120-SF	1386	0.1 - 3.0	2000	A-60-SF-2 CE	1446
0.2 - 8.0		2000	B-100-SF	1189	0.2 - 8.0	2000	B-100-SF-2 CE	1447
0.2 - 10.0		2000	AA-100-SF	1156	0.2 - 10.0	2000	AA-100-SF-2 CE	1448

## PUMPS WITH EXPLOSION PROOF MOTORS

■ Motor meets Class I Group D requirements

	Voltage 115 VAC			
	Flow Rate Range <sup>§</sup> (mL/min)	Max Press. (psi)	Model Number	Order Number
<b>316 s/s</b>	0.2 - 5.7	5000	B-72-EXP	1472
	1.0 - 23.0	1250	B-72-4-EXP	1473

<sup>§</sup> Maximum flow rate specifications are based on theoretical volume displacement; actual flow rates will vary depending on such factors as fluid viscosity, compressibility and temperature. Minimum flow rates are stated per channel, maximum flow rates are stated with combined channels.

## DUROS SERIES

- Direct dial (in mL/min) control of flow rate
- Minimized flow pulsation

	Voltage 115 VAC				Voltage 230 VAC			
	Flow Rate Range <sup>§</sup> (mL/min)	Max Press. (psi)	Model Number	Order Number	Flow Rate Range <sup>§</sup> (mL/min)	Max Press. (psi)	Model Number	Order Number
<b>316 s/s</b>	0.05 - 1.5	5000	CC-30-S	1323	0.05 - 1.5	5000	CC-30-S-2 CE	1454
	0.1 - 3.0	2500	CC-60-S	1325	0.1 - 3.0	2500	CC-60-S-2	1326
	0.25 - 7.5	5000	CC-100-S	1327	0.1 - 3.0	2500	CC-60-S-2 CE	1455
	1.0 - 30.0	2000	CC-100-S-4	1329	0.25 - 7.5	5000	CC-100-S-2 CE	1456
				1.0 - 30.0	2000	CC-100-S-4-2 CE	1457	
<b>PEEK</b>	0.05 - 1.5	4000	CC-30-S-PK	1339	0.05 - 1.5	4000	CC-30-S-PK-2 CE	1461
	0.10 - 3.0	2500	CC-60-S-PK	1341	0.1 - 3.0	2500	CC-60-S-PK-2	1342
	0.25 - 7.5	4000	CC-100-S-PK	1343	0.1 - 3.0	2500	CC-60-S-PK-2 CE	1462
	1.0 - 30.0	2000	CC-100-S-4-PK	1345	0.25 - 7.5	4000	CC-100-S-PK-2 CE	1463
				1.0 - 30.0	2000	CC-100-S-PK-4-2 CE	1464	
<b>Kel-F</b>	0.05 - 1.5	2000	CC-30-SF	1331	0.05 - 1.5	2000	CC-30-SF-2 CE	1458
	0.1 - 3.0	2000	CC-60-SF	1334	0.1 - 3.0	2000	CC-60-SF-2	1334
	0.25 - 7.5	2000	CC-100-SF	1335	0.1 - 3.0	2000	CC-60-SF-2 CE	1459

## VS SERIES

- Local or remote control of motor speed
- Expand low flow rate range with optional micrometer control

	Voltage 115/230 VAC			
	Flow Rate Range <sup>§</sup> (mL/min)	Max Press. (psi)	Model Number	Order Number
<b>316 s/s</b>	0.025 - 1.5	5000	A-30-VS	1262
	0.05 - 3.0	2500	A-60-VS	1263
	0.1 - 6.0	1000	A-120-VS	1264
	0.2 - 10.0	5000	B-125-VS	1265
	1.0 - 40.0	2000	B-125-VS-4	1266
	0.2 - 12.5	5000	AA-125-VS	1267
	3.0 - 53.0	5000	BB-4-VS*	1481
	12.0 - 144.0	5000	BBB-4-VS*	1471
<b>PEEK</b>	0.025 - 1.5	4000	A-30-VS-PK	1295
	0.05 - 3.0	2500	A-60-VS-PK	1296
	0.1 - 6.0	1000	A-120-VS-PK	1297
	0.2 - 10.0	4000	B-125-VS-PK	1298
	1.0 - 40.0	2000	B-125-VS-4-PK	1209

\*Power requirements are 115V/60Hz; unit is not voltage switchable.

## Spare Parts/Accessories

### Preventive Maintenance Kits

• for 1/8" A, B, AA Pumps	Order No.
for 316 s/s pumps, UHMW polyethylene seals	1388
for 316 s/s pumps, GF PTFE seals	1389
for Kel-F <sup>®</sup> pumps, UHMW polyethylene seals	1390
for Kel-F <sup>®</sup> pumps, GF PTFE seals	1391
for PEEK <sup>®</sup> pumps, UHMW polyethylene seals	1479

### Preventive Maintenance Kits

• for 1/8" CC Pumps	Order No.
for 316 s/s pumps, UHMW polyethylene seals	1400
for 316 s/s pumps, GF PTFE seals	1401
for Kel-F <sup>®</sup> pumps, UHMW polyethylene seals	1403
for Kel-F <sup>®</sup> pumps, GF PTFE seals	1404
for PEEK <sup>®</sup> pumps, UHMW polyethylene seals	1480

### Preventive Maintenance Kits

• for 1/4" Pumps	Order No.
for 316 s/s pumps, UHMW polyethylene seals	1393
for PEEK <sup>®</sup> pumps, UHMW polyethylene seals	1494

For microliter and sub-microliter flow rates, ask for our MicroPro product line brochure



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