

# Pump Technologies for OEM Applications

Gear Pumps  
Piston Pumps  
Diaphragm Pumps  
Peristaltic Pumps  
Accessories





## IDEX Health & Science

### Compact, Low-Flow Precision Pumps for OEM Applications

Piston pump? Peristaltic? Which would be best for your application? And why? For OEMs, IDEX Health & Science offers a wide range of pumping technologies as well as a broad array of performance parameters. From air-operated double diaphragm pumps safe for use in containing corrosive chemicals to high-precision dispense pumps used in in-vitro diagnostic applications, all products are fully tested to meet your requirements.

### Delivering Fluid Delivery

IDEX Health & Science is an integrated resource for OEM liquid subassemblies and gas management systems as well as precision components. Working with IDEX Health & Science, you have one point of contact—one vendor, yet a full spectrum of fluidic components and experts—for a totally integrated assembly or module. If a pump solves your business problem, we can provide just the pump. But if you want a custom, integrated fluid delivery system, we offer the technologies and the engineering resources to support your application from concept through manufacture.

### Committed to Your Success

Each Health & Science product line is manufactured in an environment of continuing process improvement using Lean Manufacturing and Operational Excellence tools such as Value Stream Mapping, Kaizen, and DFSS.

Make IDEX Health & Science your integrated resource for liquid subassemblies and precision components:

- **Eastern Plastics** manifolds and precision machined components
- **Gast**® vacuum pumps and compressors
- **Ismatec**® gear, piston and peristaltic pumps
- **Jun-Air** ultra-quiet clean-air compressors
- **Micropump**® external and micro-annular gear pumps
- **Rheodyne**® high and low pressure valves
- **Sapphire Engineering**™ precision dispense pumps, pump components and flow cells
- **Systemc**® degassers
- **Trebor**® ultra-high-purity chemical pumps
- **Upchurch Scientific**® fittings and tubing



## Piston Pumps

### Valveless and Multiple-Piston Pumps

The valveless and multiple-piston pump families offer the greatest range of sizes and functionality among the Health & Science pump technologies for both high-viscosity, semi-solid fluids and high-pressure, low-viscosity fluids. Some pump designs feature no-check-valve construction that eliminates clogging and maintenance concerns, even with aggressive, corrosive, or higher viscosity fluids.

#### Specifications

Advantages	High Volumetric Efficiency High Precision and Accuracy Excellent Chemical Resistance Extremely Long, Reliable Service Life Low Cost of Ownership
Flow Rate Range	5 – 940 mL/min (0.248 g/h)
Temperature (max)	100 °C

### Precision Displacement and Syringe Pumps

Precision displacement pumps and syringe pumps were designed primarily for applications requiring high-precision aspirating and dispensing of fluids. These variable-stroke piston pumps are available in a wide range of sizes and configurations for your specific instrument and market. From long life precision displacement pumps to zero dead volume syringe pumps, from nanoliter dispensing to milliliter dispensing, from vacuum to more than 1000 psi, we have the right product for you.

#### Specifications

Advantages	High Precision and Accuracy Low Cost of Ownership Fully Customizable Options
Total Volumes Available	25 µL – 10 mL
Resolution per step	0.0063 – 2.5 µL
Precision	< 2% CV
Temperature (max)	60 °C

#### Markets

- Analytical instrumentation
- Biotechnology
- Chemical processing
- Food & beverage
- Pharmaceuticals
- Medical & diagnostic equipment
- Energy & fuel cells
- Water disinfection



## Gear Pumps

### External Gear Pumps

Gear pumps provide a more continuous, pulseless flow than many other positive displacement pumps. The rigid design of the gears and housing allows for high pressures and the ability to pump viscous fluids. Manufactured in a wide range of chemically resistant materials, these compact, magnetically driven gear pumps feature leak-free performance as well as a wide range of customizing options.

#### Specifications

Advantages	Compact Designs Leak-Free Operation Smooth, Pulseless Flow Excellent Repeatability Easy to Field Service
Flow Rate Range	10 mL – 42 L/min (11.1 g/m)
Differential Pressure (max)	8.7 bar (125 psi)
Temperature (max)	177 °C

#### Markets

- Chemical processing
- Food & beverage
- Medical equipment
- Power generation plants
- Petrochemical
- Paints & inks
- Electronics cooling
- Pulp & paper
- Aerospace



### Micro-Annular Gear Pumps

No other technology offers the same high pressure and low flow rate in such a small package. Tiny micro-annular pumps are suitable for low viscosity liquids such as deionized water, watery solutions, methanol, solvents, oil and lubricants. These high precision, ultra-low flow pumps provide tight flow-rate control, helping conserve valuable liquids. Internal gear technology keeps pulsation to an absolute minimum for smooth, constant flow.

#### Specifications

Advantages	High Precision Dosage Accuracy Miniature Size Ultra-Low Pulseless Flow Long Service Life
Flow Rate Range	0.15 – 288 mL/min (4.56 g/h)
Differential Pressure (max)	80 bar (1160 psi)
Temperature (max)	60 °C
Size	As small as 13 mm (diameter) x 75 mm (length)

# Technology Comparison Chart

## PISTON

APPLICATIONS	Precision Displacement		Syringe	Multiple	Valveless
	Low Pressure	High Pressure			
Cell Cultures					
Ultra-High Purity Liquids	✓				
Corrosive Liquids	✓		✓	✓	✓
Hazardous Liquids	✓				
Abrasive Liquids					✓
Food-Grade Liquids	✓				✓
Low Viscosity	✓		✓	✓	
High Viscosity	✓		✓		✓
Solids					✓
Extreme Temperatures					
<b>CHARACTERISTICS</b>					
Dispense	✓		✓		
Continuous Flow				✓	✓
Pulseless Flow					
Flow Rate Range				5–60 mL/m	5–940 mL/m
Total Pump Volume	25 µL to 5 mL		1.0 ml, 10 ml		
Resolution	0.0063 – 1.6667 µL/step		0.400 – 2.500 µL		
Maximum System Operating Pressure	< 500 psi	9000 psi	50 psi	100 psi	100 psi
Maximum Differential Pressure				100 psi	100 psi
Self Priming	✓		✓	✓	
Totally Encapsulated Fluid Path					
Wetted Materials	Acrylic Ultem® UHMWPE Viton® TZP Ceramic Custom Available	PEEK™ Stainless Steel UHMWPE Viton® TZP Sapphire, Ceramic Custom Available	Polypropylene Neoprene Viton® Teflon® Polyethylene	UHMWPE Zirconia PEEK™ Alumina Viton® Custom Available	UHMWPE Zirconia PEEK™ Alumina Viton® Custom Available
Accuracy	±1%		±1%	±0.5%	±2%
Precision	< 1% CV		2% CV		
Routine Maintenance	None required		Syringe replacement	None required	None required
Warranty	12 month		12 month	18 month	18 month
Brand	Sapphire Engineering		Sapphire Engineering	Micropump	Micropump

## GEAR

## DIAPHRAGM

## PERISTALTIC

APPLICATIONS	External	Micro-Annular	Double Diaphragm	Single, Multi-Channel	APPLICATIONS
	Cell Cultures				
Ultra-High Purity Liquids			✓	✓	Ultra-High Purity Liquids
Corrosive Liquids	✓	✓	✓	Tubing dependent	Corrosive Liquids
Hazardous Liquids			✓		Hazardous Liquids
Abrasive Liquids	✓		✓		Abrasive Liquids
Food-Grade Liquids				✓	Food-Grade Liquids
Low Viscosity	✓	✓	✓	✓	Low Viscosity
High Viscosity	✓		✓	✓	High Viscosity
Solids				To 60%	Solids
Extreme Temperatures			✓		Extreme Temperatures
<b>CHARACTERISTICS</b>					
Dispense		✓		✓	Dispense
Continuous Flow	✓	✓	✓	✓	Continuous Flow
Pulseless Flow	✓	✓		With 12 rollers	Pulseless Flow
Flow Rate Range	10 mL/m to 42 L/m	0.15 – 288 mL/m	1 – 95 L/m	0.008 – 5400 mL/min	Flow Rate Range
Total Pump Volume					Total Pump Volume
Resolution					Resolution
Maximum System Operating Pressure	5000 psi	290 psi	80 psi	Limited by tubing	Maximum System Operating Pressure
Maximum Differential Pressure	125 psi	1160 psi	80 psi	36 psi	Maximum Differential Pressure
Self Priming	✓	✓	✓	✓	Self Priming
Totally Encapsulated Fluid Path	✓		✓	✓	Totally Encapsulated Fluid Path
Wetted Materials	316 SS Alloy 20 Titanium Hast C-276® PEEK™ Viton® Custom Available	316 SS Nickel Silver Epoxy Resin Tungsten Carbide PTFE Custom Available	PTFE/PFA	Wide range of tubing material available	Wetted Materials
Accuracy	±1%	±1%	±10%	±1%	Accuracy
Precision					Precision
Routine Maintenance	None required	None required	1-2 year rebuild	Tubing replacement	Routine Maintenance
Warranty	18 month	18 month	1-2 year	2 year	Warranty
Brand	Micropump	Micropump	Trebor	Ismatec	Brand



## Diaphragm Pumps

### Double Diaphragm Pumps

Air-operated double diaphragm chemical pumps lead the microelectronics pump market in purity, reliability and support. Chemically compatible with virtually all process acids and solvents, these compact pumps are produced in clean-room environments, utilize few moving parts and deliver long service life. Total non-metallic pump construction with PFA & PTFE wetted parts prevents corrosion and virtually eliminates all process-chemical contamination risk.

#### Specifications

Advantages	Air Operated Ultra-Pure Fluid Path Non-Metallic Construction Low Cost of Ownership
Flow Rate Range	1 – 95 L/min (25 g/m)
Temperature (max)	180 °C
Pressure	Up to 5.5 bar (80 psi)

#### Markets

- Microelectronics
- Chemical processing
- Pharmaceutical
- Healthcare
- Water treatment
- Biotechnology



## Peristaltic Pumps

### Single and Multi-Channel Pumps

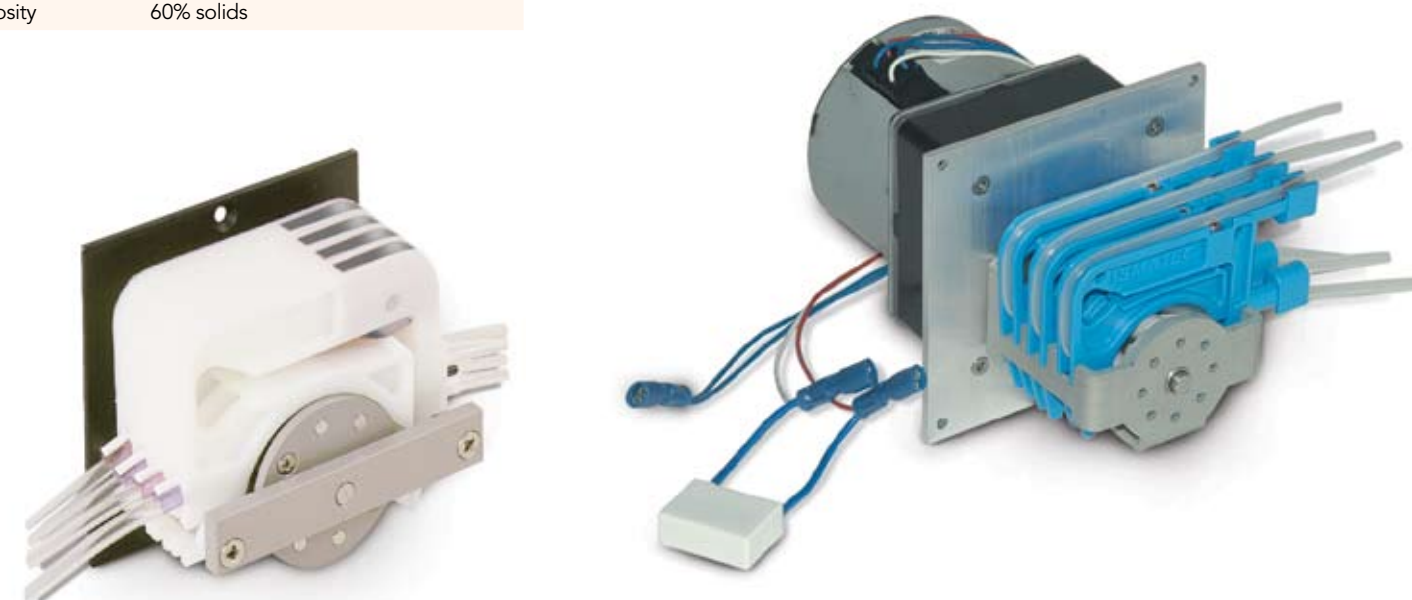
Peristaltic pumps are the optimal choice with live cells and sterile fluids because the pump cannot contaminate the fluid, or with aggressive fluids because the fluid cannot damage the pump. Since no moving parts contact the fluid, peristaltic pumps are easy to sterilize and require no routine flushing or cleaning. Peristaltic pumps are immune to dry-running. Pump designs with 12 roller pump heads offer nearly pulse-free pumping.

#### Specifications

Advantages	Ultra Pure Flow Path Live Cell Pumping 1–24 Channels Easy Sterilization
Flow Rate Range	0.008 – 5400 mL/min
Differential Pressure (max)	1.5 bar (21.7 psi)
Temperature (max)	Depends on tubing
Viscosity	60% solids

#### Markets

- Analytical instrumentation
- Biotechnology
- Medical equipment
- Food & beverage
- Pharmaceutical
- Printing
- Plating
- Chemical processing
- Water treatment





# Accessories

## Magnetic & Direct Drives

Designed to meet the specific performance requirements of OEM and industrial applications



## Controllers, Diagnostics & Software

For active control, fault detection and PC integration



## Trademarks

The following Trademarks and Registered Trademarks appear in this brochure:

**Ismatec**® is a Registered Trademark of Ismatec SA

**Micropump**® is a Registered Trademark of Micropump, Inc.

**PEEK**™ polymer is a Trademark of Victrex plc

**Sapphire Engineering**™ is a Trademark of Sapphire Engineering, Inc.

**Teflon**® is a Registered Trademark of E.I. du Pont de Nemours and Company, used under license by Upchurch Scientific, Inc. Only DuPont makes Teflon®

**Trebor**® is a Registered Trademark of Trebor International

**Ultem**® is a Registered Trademark of General Electric Corporation

**Viton**® is a Registered Trademark of E.I. du Pont de Nemours and Company

## Interchangeable Tubing Cassettes

For peristaltic pumps



## Fiber-Optic Probes

Detect leaks, count strokes, and provide pump control and diagnostics



## Fluid Line Surge Suppressors

Compensate for line pulsation on air-operated pumps



## Tool Kits & Interchangeable Parts



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