



2014
CATALOG

FLUIDIC PRODUCTS & INFORMATION for INSTRUMENT MANUFACTURERS

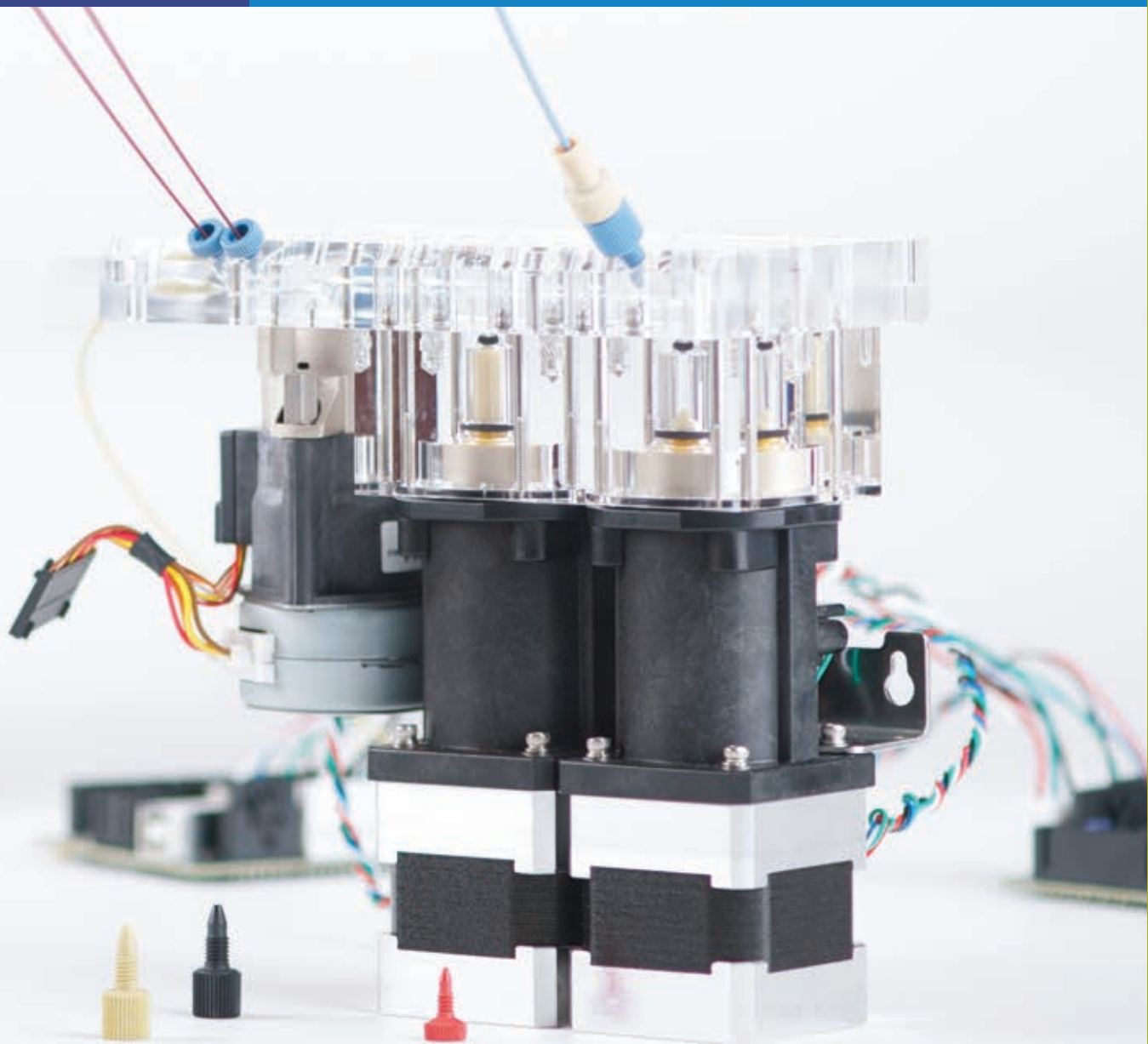
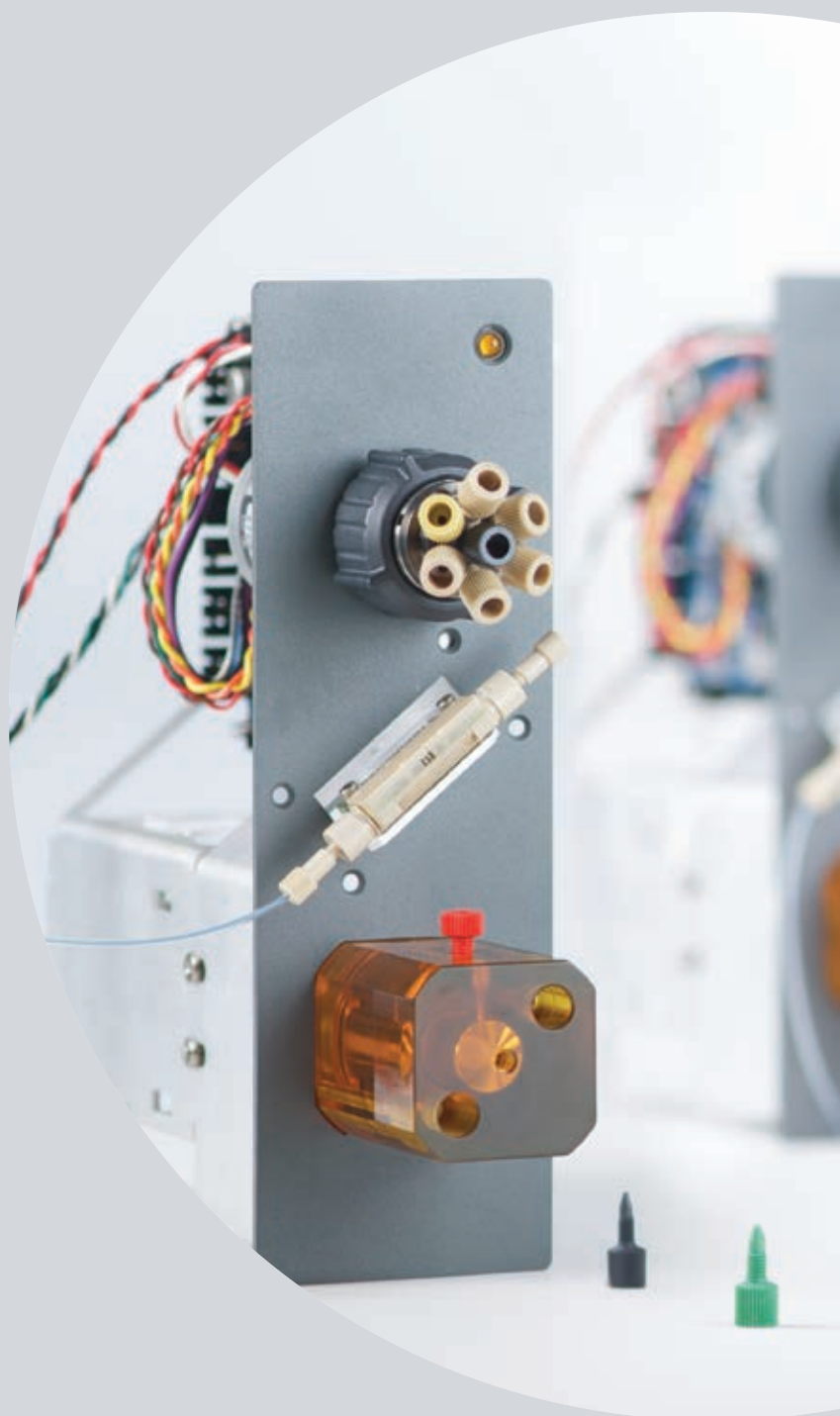


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IDEX HEALTH & SCIENCE

WHO WE ARE

IDEX Health & Science manufactures highly respected fluidic components used in instruments that require precise, low-volume control for sample processing, reagent management, sample chemistries, and other analytical tasks performed with fluids.

WHY WE'RE DIFFERENT

IDEX Health & Science is the flow path expert

We present the broadest portfolio of fluidic technologies available, plus the specialty engineering resources to resolve newly recognized issues that arise as scientific innovation progresses beyond the known levels of complexity, miniaturization, and sample throughput.

- ▶ How does liquid behave in a tube with a flow path smaller than a human hair?
- ▶ What makes fluidic precision even more challenging at atmospheric pressure than at 30,000 psi? Or at nano flow rates?
- ▶ What does it take to build a pump that delivers unparalleled accuracy and precision for the life of a diagnostic instrument?

And, after you've made that first pump, how do you scale production rapidly to meet the demand for 300 or 5,000 pumps the first year alone? Backed by the resources of IDEX, a provider of engineered products, in business for more than twenty-five years, IDEX Health & Science does.

Tubing, connections

- ▶ Low-to-high pressure tubing, connections
- ▶ Time-saving tubing assemblies
- ▶ Newest PEEK-lined stainless steel (PLS)



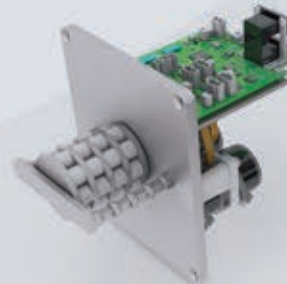
Rotary shear valves

- ▶ Pressures from 0 to 25,000 psi
- ▶ Switching, Injection, Selection flow paths
- ▶ Custom valve development



Specialized peristaltic pumps

- ▶ New independent-channel control
- ▶ 1- to 24-channel designs
- ▶ Digital and analog control



WHAT WE DO FOR YOU

IDEX Health & Science offers standard and custom products known for best-in-class fluidic performance in critical chemical analysis, separations, and diagnostic applications. We leverage our deep application knowledge to improve the portfolio through innovation to stay ahead of market trends, like higher pressure, biocompatible materials, dispense precision, power consumption, and component size. In many cases, our integrated IDEX Health & Science assemblies, which provide turnkey installation, can reduce customer assembly and test cost significantly, offering the greatest possible value for you.

Precision dispense pumps

- ▶ Dispensing: 1 to 5,000 μ L at 1% CV
- ▶ Long life — 2 to 5 million cycles
- ▶ Eliminate preventive maintenance
- ▶ Custom LC-pump components



Degassing and detection technologies

- ▶ Active degassing and debubbling
- ▶ Increased instrument precision
- ▶ Chromatography and IVD applications



Innovative fluidic manifolds

- ▶ Custom designed to the instrument
- ▶ Advanced engineering materials
- ▶ Hematology, immunoassay, flow cytometry, clinical chemistry, sequencing
- ▶ In vitro diagnostics, genomics, biotechnology



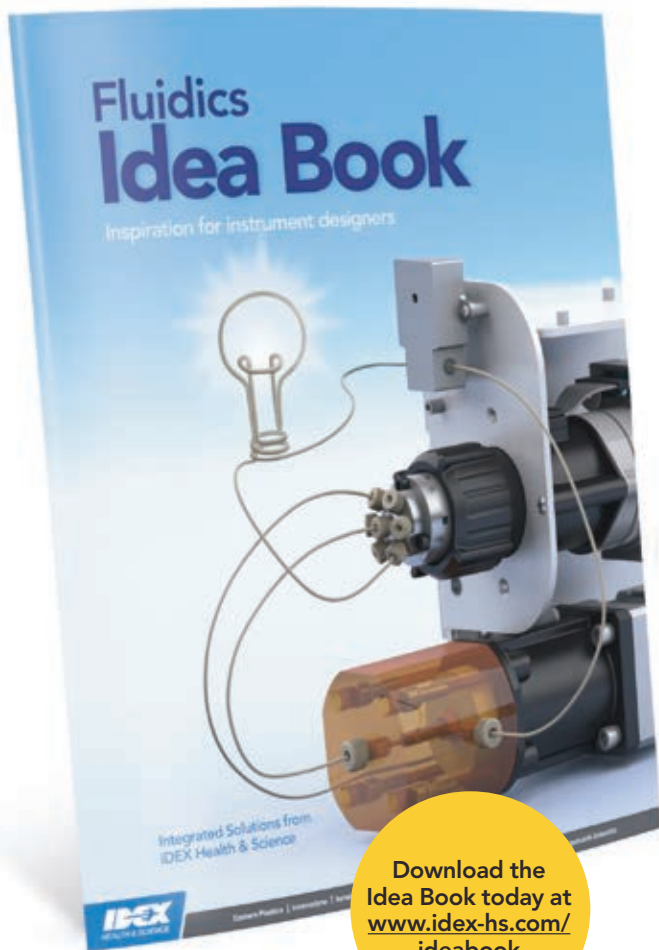
Column hardware

- ▶ NEW Interactive Column Selector
- ▶ NEW biocompatible materials
- ▶ Accessories for column protection



ADVANCED FLUIDIC DESIGN

Authored by the Director of Strategic R&D for IDEX Health & Science, Dr. Darren Lewis, The IDEA Book is a design engineer's guide to fluidic design and integration. Highly readable, yet deeply technical, The IDEA Book condenses years of fluidic development practice into 60 pages of inspiration.



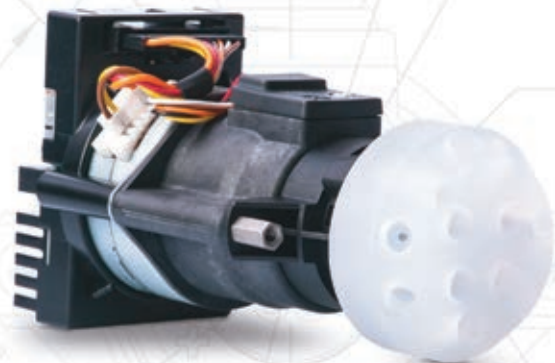
Download the
Idea Book today at
[www.idex-hs.com/
ideabook](http://www.idex-hs.com/ideabook)

ONLY CUSTOM? MAYBE NOT.

Our companion lab catalog offers approximately 3,000 parts most requested by laboratories. Still, that's only a fraction of the products available to OEMs. We routinely make thousands of specialized parts for volume customers.

Suppose a part you need isn't listed. That doesn't always mean we'd start with a blank CAD screen to make it for you — nor that it always requires lengthy development time. In fact, we may already be far along the timeline of delivery to you — so please ask! Behind the scenes, a vast library of product configurations, functions, and proven materials already exists for every product line, as well as a deep talent pool of experienced manufacturing specialists who machine, mold, extrude, and assemble our products.

Even so, we still can't say YES! to every request for custom development.



Demand for these high-precision fluidic products is high, as is the need for constant technical innovation. To stay ahead of our rapidly evolving markets, the scientists, engineers, and technical experts who design and make IDEX products must focus on meeting the needs of these emerging technologies such as micro- and nano-fluidics, chip-based analyses, and point-of-care.

Over the years, we've learned that certain custom requests align well with the development goals of our IDEX brands. We're most likely to accept these custom projects when your goals match ours. Other qualifications include number of systems required, timing to market, anticipated lifetime of the instrument platform, and whether we'd work on only part of your flow path or the entire fluidic circuit. We win when we win together.

Scientific instruments that utilize our highly precise, low-volume fluidic expertise all encompass several common fluidic tasks. We excel at four, and can contribute greatly to your instrument in these areas: Sampling; Reagent Handling; Sample Chemistry; Wash Systems.

Of course, when we execute your entire fluidic circuit, we handle everything for you — and that's where you realize the greatest economy and instrument efficiency. However, if you ask us for custom engineering outside our areas of greatest interest, (e.g. bulk fluid management or waste fluid removal) we'll probably refer you to someone who can better meet your budget requirements. On the next two pages, we'll illustrate simple approaches to the four areas we consider critical to any instrument.



CRITICAL INSTRUMENT FLUIDICS FOR LIFE SCIENCES

Sampling

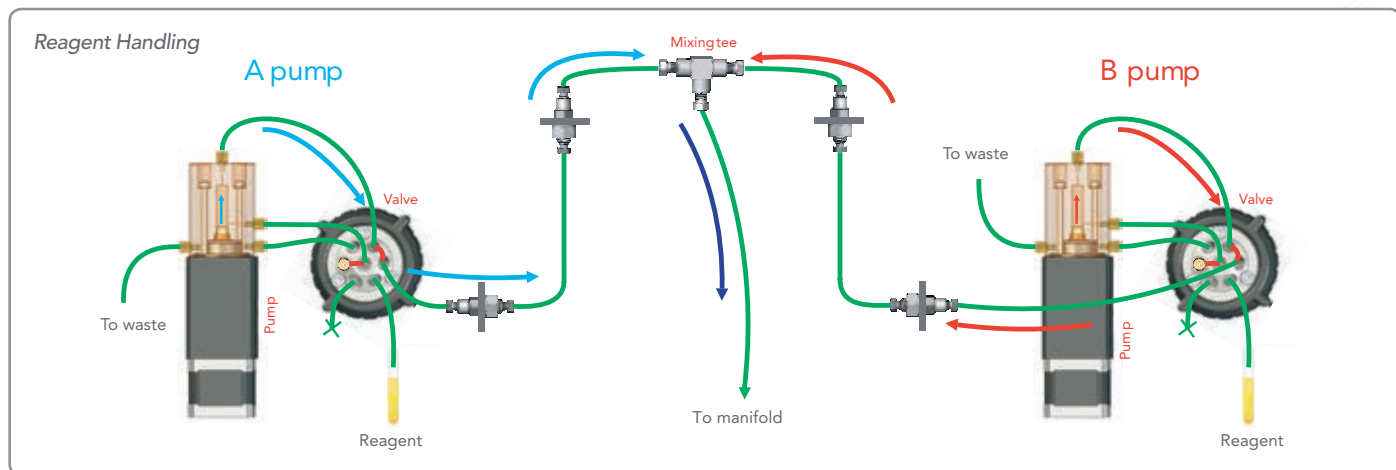
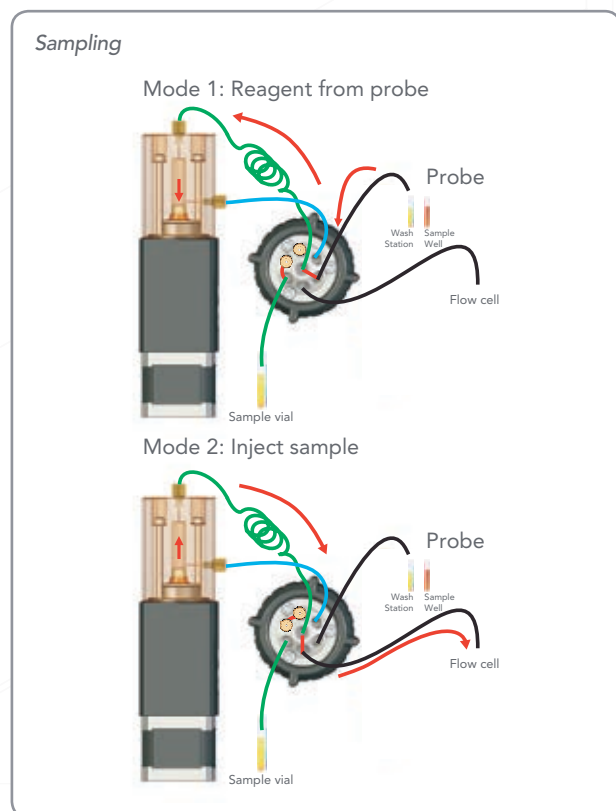
Sample Analysis always involves limited quantities that must be preserved in a discrete fluid plug without carryover to another sample. Largely from biological sources, analytes are not purified and may contain artifacts unwanted in the analysis, yet typically small volumes preclude use of most filters.

In this automated sample example, a positive displacement pump aspirates sample through a probe into a fixed loop. A rotary valve then switches the sample to an outlet stream for dispensing to devices downstream. The unique valve configuration allows complete rinsing of the pump between samples to prevent carryover.

Reagent Handling

Reagent delivery systems channel purified, homogeneous solutions that — while abundant in volume — must be preserved and managed to maintain a flow path free of crystals, sediments, or particulates. Ideal reagent management involves unidirectional flow, back-flow prevention, and routine rinsing protocols to ensure optimal preservation of expensive reagents.

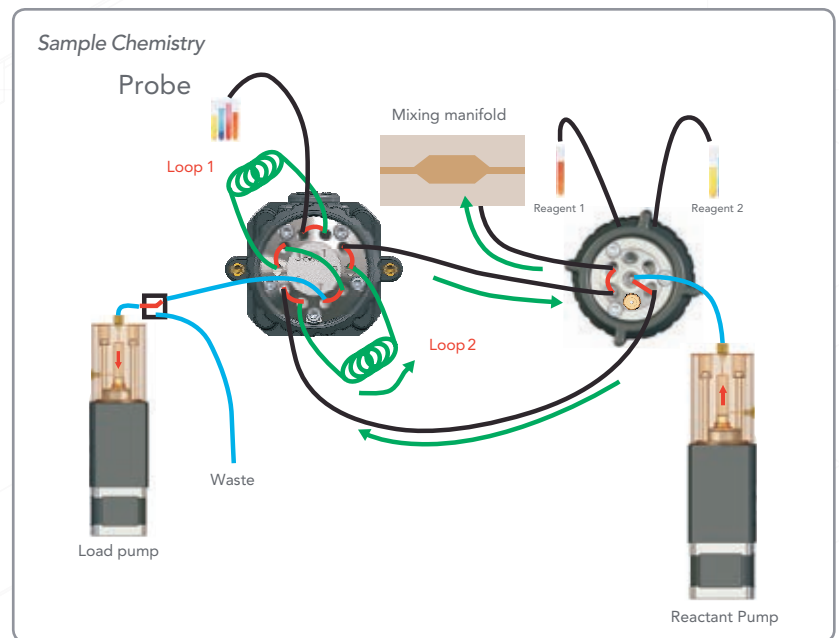
This example illustrates extremely regulated reagent mixing prior to introduction to a manifold. Alternately — or subsequently — internal mixing could occur within the manifold's mixing channels.



Sample Chemistry

Sample chemistry involves creating an environment favorable for desired reactions between samples and reagents. A manifold, with mixing chambers, heating or conductive elements, provides a well-swept flow path that enables consistent mixing and reproducible reactions. A compact manifold utilizes small reagent volumes, reducing the cost per test.

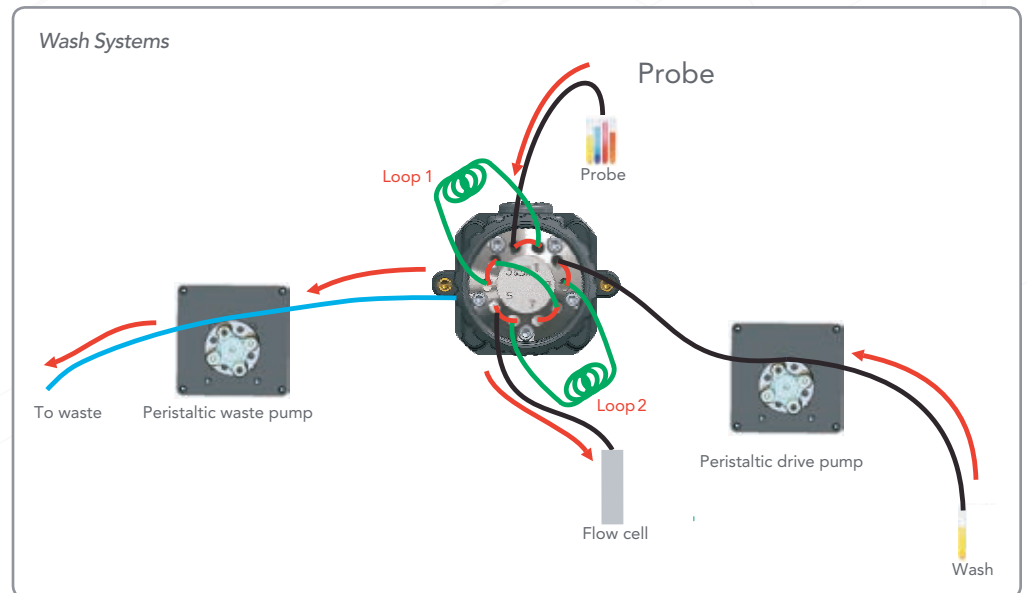
This configuration shows a methodology for sequentially acquiring samples, then using a second drive pump to mix the samples with a reagent, followed by incubation with a reaction cell.



Wash Systems

Material/chemical compatibility often tops flow-rate precision in wash/rinse systems where harsh reagents such as bleach or alcohol may be used. Our wash systems include completely reproducible methods that remain consistent over time.

This example shows sequential injection of timed sample plugs using alternating injection loops on a shear valve. A thorough rinse protocol ensures low sample carryover between injections. Economical waste pumps drain spent fluids post-analysis.



Fluidic System Integration

Although each fluidic system is unique, some fundamental principles guide our development. We design compact, consistent fluidic circuits that lower cost per test and support high-quality analysis. We start with what you want to accomplish. Analytical considerations like flow cell positioning drive the design; fluid ratios, flow rates, and dispense volumes support the science. We position components to speed assembly and enable preventive maintenance. There's lots more. Call us!

FOR OEMs

PRECISION

DISPENSE PUMPS

IDEX Health & Science offers an array of high-precision, long-life pumps for low volume applications. Pumps from the three product lines are commonly deployed in HPLC, clinical chemistry, hematology, and other IVD instruments.

For lower-pressure applications, below 1,500 psi (< 100 bar), the V-Series offers a platform that provides precise dispensing and life-of-instrument performance. The VFP17 pump allows for custom mounted valving and includes various materials to ensure chemical compatibility. Whether used as a single pump, or combined with multiple units in a fluidic manifold, the V-Series is designed to be flexible and maintenance-free.

S-Series pumps provide steady flow rates and handle higher-pressure applications up to 5,000 psi (345 bar). The IPV (Integrated Piston and Valve) offers users of syringe pumps a long-life alternative to expensive glass syringes.





Dispense Pumps

	V17	VP17	VFP17	IPV	S17
Standard Sizes (total pump volume)	50 μ L, 100 μ L, 500 μ L, 1 mL	50 μ L, 100 μ L, 500 μ L, 1 mL	25 μ L, 50 μ L, 100 μ L, 250 μ L, 500 μ L, 1 mL, 2.5 mL, 5 mL	100 μ L, 250 μ L, 500 μ L, 1 mL, 2.5 mL, 5 mL	50 μ L, 100 μ L, 250 μ L, 500 μ L, 1 mL, 2 mL, 3 mL, 5 mL
Maximum Operating Pressure	500 psi (30 bar)	500 psi (30 bar)	1500 (100 bar)	100 psi (7 bar)	5,000 (345 bar)
Dispense Volume Min/Full Step	0.0125 μ L (50 μ L) to 0.5000 μ L (1 mL)	0.0125 μ L (50 μ L) to 0.5000 μ L (1 mL)	0.0063 μ L (25 μ L) to 2.500 μ L (5 mL)	*	0.0083 μ L (50 μ L) to 0.5556 μ L (5 mL)
Dispense Rate Maximum (mL/min)	3.7 (50 μ L) to 75 (1 mL)	3.7 (50 μ L) to 75 (1 mL)	1.8 (25 μ L) to 250 (5 mL)	*	1.2 (50 μ L) to 125 (5 mL)
Dispense Inaccuracy	\pm 0.4% at full dispense	\pm 0.4% at full dispense	\pm 0.4% at full dispense	*	< 1%
Dispense Precision	2% dispense: < 1.0% CV	2% dispense: < 1.0% CV	2% dispense: < 1.0% CV	*	100% dispense: < 0.2% CV 10% dispense: < 0.5% CV 1% dispense: < 2% CV
Resolution (full steps per stroke)	2,000–4,000	2,000–4,000	2,000–4,000	*	3,000–6,000
Wetted Materials: Head	Acrylic	Acrylic	Acrylic Standard; PEEK, Ultem [®] , Udel [®] , others available	PEEK Standard; Ultem and Udel available	Ultem Standard; custom materials available
Wetted Materials: Piston	TZP Ceramic; Sapphire	TZP Ceramic; Sapphire	TZP Ceramic; Sapphire	TZP Ceramic	TZP Ceramic; Sapphire
Wetted Materials: Seal	UHMWPE, Viton [®] , Customizable	UHMWPE, Viton, Customizable	UHMWPE, Viton, Customizable	UHMWPE, Viton	UHMWPE, Viton, Customizable
Operating Temperature	60–100 °F / 15–45 °C	60–100 °F / 15–45 °C	60–100 °F / 15–45 °C	62–104 °F / 17–40 °C	60–100 °F / 15–45 °C
Anticipated Life	2 million cycles	5 million cycles	5 million cycles	3 million cycles	5 million cycles
1.8 degree Bipolar Stepper Motor	Yes	Yes	Yes	*	Yes
Voltage	24 V	24 V	24 V	*	24 V
Encoder	Option	Option	Option	*	Option
Controller Board	Not included	Not included	Not included	Available with optional PVM	Not included
Seal Wash	Option	Option	Option	Limited Option	Option
Connection Ports	1/4-28 or M6	1/4-28 or M6	1/4-28 or M6	1/4-28 or M6	1/4-28 or M6
Home Position	Aspirate or Dispense	Aspirate or Dispense	Aspirate or Dispense	*	Aspirate or Dispense

* IPV fluidic dispense profiles and specifications are dependent upon the companion drive controller deployed.

V-SERIES PUMPS

The V-Series is a family of positive displacement pumps that provides precise fluid dispensing for a variety of lower pressure clinical and laboratory instruments. The V-Series is designed to offer flexibility and maintenance-free performance to tackle tomorrow's fluidic challenges.



V17

2 million cycles;
Precision dispensing
applications with lower
duty cycle

VFP17

5 million cycles;
Long life, precision fluidics
& custom options (including
mounted valves)

VP17

5 million cycles;
Economical balance
of precision & high duty
cycle performance

Standard V-Series Pump Specifications

Total Pump Volume (μL)	Lead Screw Pitch (TPI)	Resolution (μL/full step)	Min. Dispense for 1% CV (μL)	Time to Fully Dispense (sec)		Max. Backlash to Total Volume (%)	Unswept Volume (μL)		Seal Wash Volume (μL)	
				V17, VP17	VFP17		V17, VP17	VFP17	V17, VP17	VFP17
25	20	0.0125	0.5	N/A	0.8	1	N/A	12	N/A	25
	40	0.0063	0.5	N/A	1.5					
50	20	0.0250	1	0.7	0.8	1	97	19	45	32
	40	0.0125	1	1.3	1.5					
100	20	0.0501	2	0.7	0.8	1	131	27	55	42
	40	0.0251	2	1.3	1.5					
250	20	0.1250	5	N/A	0.8	1	N/A	40	N/A	41
	40	0.0625	5	N/A	1.5					
500	20	0.2499	10	0.7	0.8	1	316	61	105	89
	40	0.1250	10	1.3	1.5					
1000	20	0.5000	20	0.7	0.8	1	507	96	159	145
	40	0.2500	20	1.3	1.5					
2500	20	1.2496	50	N/A	1.0	1	N/A	194	N/A	247
	40	0.6248	50	N/A	1.8					
5000	20	2.4996	100	N/A	1.2	1	N/A	344	N/A	376
	40	1.2498	100	N/A	2.4					

* Dispense may vary with back pressure, step mode, drive current, or other application parameters.

IPV

For instruments configured with traditional syringe pumps, the IPV (Integrated Piston and Valve) greatly improves uptime by reducing the frequency and complexity of periodic maintenance. IPV units can have a 20x improvement in lifetime over traditional syringes, and this long life helps reduce the overall cost of system componentry. To ensure chemical compatibility within a system, the IPV family of products allows for flexibility in the choice of wetted materials.

IDEX Health & Science IPV units are compatible replacements for the syringe and valve of many industry-standard syringe pumps, including: Cavo™ XP 3000, Cavo™ XCalibur, Hamilton™ PSD/4, and TriContinent™ C3000.

PVM DRIVE/IPV

The compact digital PVM (Pump and Valve Module) is a self-contained, stepper motor dispensing module designed for various liquid handling applications such as automated pipetting, diluting and dispensing. The PVM utilizes a robust, direct-drive leadscrew technology for high precision and an IPV for long life.



S-SERIES PUMPS

The S17 precision dispense pump is a full-size, fully customizable pump for higher pressure applications, below 5,000 psi (345 bar). The S17 utilizes a 1.50 in (38.1 mm) stroke to accurately dispense volumes from less than 1 μ L up to 5 mL. The longer piston stroke of the S17 makes it an excellent choice for applications that require steady flow rates.

Available in a variety of sizes and materials, all S-Series pumps can be customized to meet specific high-pressure needs.



ULTRA HIGH PRESSURE CHECK VALVES

Precision elements for instrument systems

- ▶ Check valves, balls
- ▶ Filters
- ▶ Guard columns
- ▶ Pistons and assemblies



Technology Highlights

- ▶ UHPCV has minimal leakage as demonstrated by both methods: Nitrogen gas bubble test and leak tests with distilled H₂O under pressure
 - ▶ *The common acceptable industry standards for check valve leak rate is 12 bubbles per minute (BPM) or less; our new UHPCV design yields less than 1 BPM*
 - ▶ *Our new UHPCV yielded less than 1 nL/min leak when tested with distilled H₂O at 30,000 psi*
 - ▶ *UHPCV has superior design and performance than our competitor as revealed on the competitive benchmarking and evaluations with the Scanning Electron Microscope (SEM)*
- ▶ UHPCV design maximizes lifetime while minimizing check valve leakage/pressure drop
 - ▶ *Stronger new alloy better absorbs structural stress, extending the life of the check valve*



Check Valves for UHPLC	UHPCV Cartridge	UHPCV Cartridge	UHPCV Cartridge	Inline Check Valve
Part Number	40-4521	40-4532	40-4523	40-4633-01
Check Valve Dim. (in)	0.350 x 0.500	0.350 x 0.508	0.375 x 0.661	0.563 Hex x 1.444
Rated Pressure (psi)	30,000	30,000	10,000	15,000
Designed Flow Rate (mL/min)	12	40	12	12
Material	New proprietary alloy, ruby ball, ceramic seat	New proprietary alloy, ruby ball, ceramic seat	316 Stainless Steel with Natural PEEK end caps, ruby ball, ceramic seat	316 Stainless Steel housing

SPECIALIZED PERISTALTIC PUMPS

For Industrial, Biotechnology, and Laboratory Applications

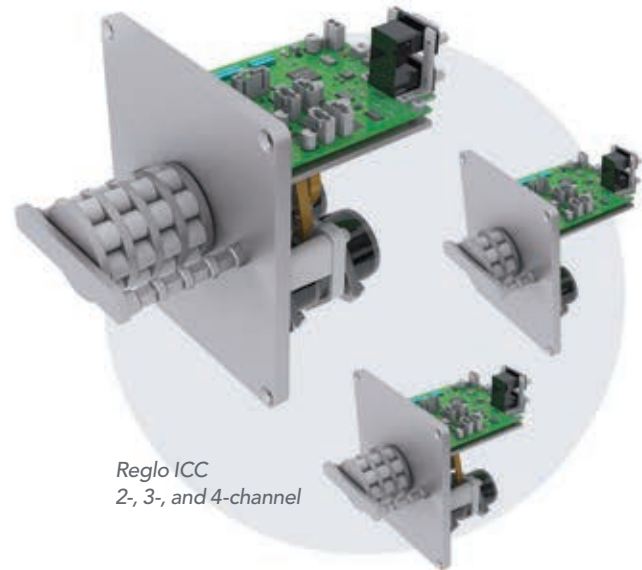
REGLO ICC 2-, 3-, & 4-CHANNEL PANEL MOUNT PUMP

Specifications

- ▶ Multiple coaxial bi-directional roller heads operate independently
- ▶ Flow range of 0.0002–35.0 mL/min
- ▶ Identical, independent drive trains for each channel; Frame 14 stepper motor with a 100:1 gear ratio
- ▶ Independent channel control
- ▶ 2-, 3-, and 4-channel versions
- ▶ Select 6, 8, or 12 rollers per channel; mix and match as needed between channels
- ▶ Software provides easy control of all independent channels

Benefits

- ▶ Operates like two, three, or four separate pumps
- ▶ Extremely useful for low flow precision
- ▶ Accurate, precise, easy to operate
- ▶ Calibrate each channel independently, achieving greater reproducibility than any other pump in the market
- ▶ Tailor your pumping needs to your application — buy only the pumps and control you will need
- ▶ Fewer rollers achieves greater flow rates while more rollers reduces pulsing



Reglo ICC
2-, 3-, and 4-channel



ISM3000
1-channel



ISM3001
4-channel

ISM3000 1-CHANNEL PANEL MOUNT PUMP

Specifications

- ▶ 1-channel, 4-roller pump; 1.6 to 160 RPM incremental in 0.01 RPM minimum resolution
- ▶ Quick tubing release
- ▶ Tubing bed has four-way tubing entrance and exit points
- ▶ Frame 17 motor, direct drive pump; 24 V DC with a 1.8° step degree
- ▶ Available tubing sizes are 3.2 mm and 4.8 mm ID with a 1.6 mm wall thickness
- ▶ Flow range of 1.05–240 mL/min
- ▶ Direct drive of the roller head from the stepper motor

Benefits

- ▶ Precision control of a medium flow rate range
- ▶ Tube change in under five seconds
- ▶ Design your fluid path: fluid inlet and outlet on the same side of the pump or traverse the pump
- ▶ Standard NEMA motor, universally simple to incorporate into your instrument
- ▶ Employs standard tubing
- ▶ Increased reliability and reduced cost due to fewer pump parts without a gear box to maintain

ISM3001 4-CHANNEL PANEL MOUNT PUMP

Specifications

- ▶ 4-channel, 6-roller pump; 1.6 to 160 RPM incremental in 0.01 RPM minimum resolution
- ▶ Industry standard MS/CA cassettes designed for use with Three Stopper tubing
- ▶ Industry standard Frame 17 motor, direct drive pump. 24 V DC with a 1.8° step degree; full 1/2, 1/4, and 1/8 Micro Step Setting
- ▶ Available tubing sizes are 0.13 mm through 3.17 mm ID
- ▶ Flow range of 0.002–68 mL/min
- ▶ Direct drive of the roller head from the stepper motor

Benefits

- ▶ Precision control of the flow rate of all four channels
- ▶ Precise stopper placement minimizes tubing twist and slip to ensure accuracy
- ▶ Employs standard tubing
- ▶ Fluidic versatility of low flow and precision of the sample side or higher flow rates for reagent addition or wash channels
- ▶ Increased reliability and reduced cost due to fewer pump parts without a gear box to maintain

FOR OEMs

ROTARY SHEAR VALVES

Rotary Shear Valves were developed in tandem with the evolution of HPLC, where combinations of elevated system pressures, aggressive chemicals, and ever-diminishing fluid volumes continually challenged system manufacturers who required highly precise fluid control and delivery. Today, many other disciplines utilize Rotary Shear Valves for their versatility, reliability, repeatability, and easy preventive maintenance.




Rotary Shear Valves
TitanHT™
TitanHP™
TitanEZ™

Pressure Rating	0–25,000 psi (0–1,724 bar)	0–6,000 psi (0–414 bar)	0–102 psi (0–7 bar)
Available Liquid Ends	2-position, 4-port		X
	2-position, 6-port	X	X
	2-position, 10-port	X	X
	3/7 injector with purge	X	X
	4-position, 5-port		X
	4-position, 4-port		X
	6-position, 7-port	X	X
	10-position, 11-port	X	X
	Custom Configurations	X	X
Wetted Materials	DuraLife®, UltraLife™*, Stainless Steel w/PEEK, all PEEK	DuraLife*, DuraLife II*, Stainless Steel w/PEEK, all PEEK	PEEK, UHMWPE, Ceramic
Port-to-Port Volume	0.2–50.9 µL	0.28–0.50 µL	24–30 µL
Flow Passage Diameters	0.006–0.060 in 0.15–1.5 mm	0.004–0.012 in 0.10–0.30 mm	0.060 in 1.5 mm
Operating Temperature	0–60 °C	0–60 °C	0–60 °C
Connections	10–32, M4, 1/4-28	10–32, M4	1/4-28, customizable, and manifold mountable
Replacement Components	Rapid Replacement Pod™, RheBuild® Kit, replacement stators, rotor seals	Rapid Replacement Pod, RheBuild Kit, replacement stators	Replacement stators
Position Capability		Multiposition with random access	
Optional Driver Board	Yes	Yes	Yes
Stop-to-Stop Actuation Speed	100–280 ms	100–280 ms	100–280 ms
Communication Protocols Available	BCD, Level Logic Pulse, Dual Pulse, I2C, UART		

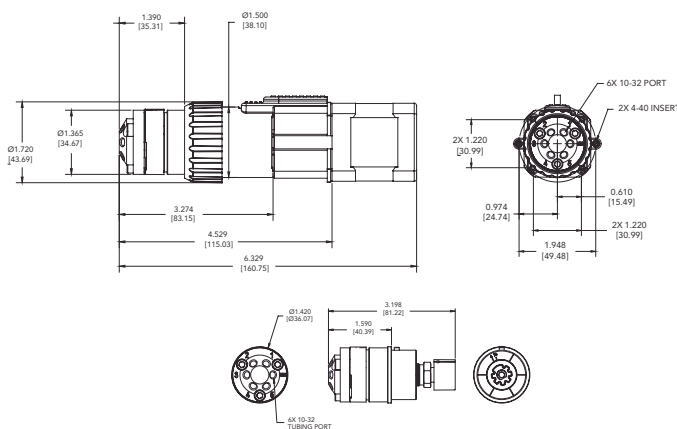
* Rheodyne material combinations.

TITANHT™

To 25,000 psi (1,724 bar)

Advances in valve technology combine to heighten performance in the TitanHT, including a larger motor providing additional torque, and a variety of materials for the liquid end for chemical compatibility. Choices include metal-on-metal, metal/polymer, and metal-free liquid paths. Rapid Replacement Pods enable fast preventive maintenance.

Integration of the optional driver board and firmware enables shorter product development cycles and reduced time-to-market. OEM customers only need to provide the digital control signals and 24 V DC power in order to achieve random access actuation and position feedback. All valves may be controlled by BCD, I2C, UART, Pulse or Dual Pulse standards; two-position valves may also be controlled with level logic.



Part No.	Pressure	Positions	Ports	Passage Size	Internal Volume	Typical Flow Rate	Notes
SELECTED TITANHT VALVE SPECIFICATIONS — CONTACT FACTORY FOR ADDITIONAL OPTIONS							
HT725-000	0–25,000 psi	2	6	0.010" (0.25 mm)	0.35 µL	0.5–5 mL/min	Injection/switching
HT718-000	0–18,000 psi	2	6	0.012" (0.3 mm)	0.3 µL	0.5–5 mL/min	Injection/switching
HT718-105	0–18,000 psi	6	7	0.012" (0.3 mm)	0.3 µL	0.5–5 mL/min	Selection, dispensing, fractionation
HT718-102	0–18,000 psi	2	10	0.006" (0.15 mm)	0.14 µL	0.5–5 mL/min	Switching valve
HT715-000	0–15,000 psi	2	6	0.012" (0.3 mm)	0.3 µL	0.5–5 mL/min	Injection/switching, with MBB®
HT715-105	0–15,000 psi	6	7	0.012" (0.3 mm)	0.3 µL	0.5–5 mL/min	Selection, dispensing, fractionation
HT715-102	0–15,000 psi	2	10	0.006" (0.15 mm)	0.14 µL	0.5–5 mL/min	Switching valve

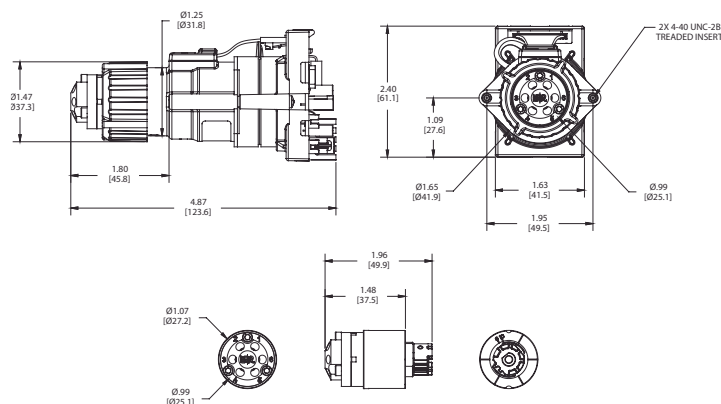
VALVE DRIVER BOARDS FOR TITANHT		
Part No.	Valve Type	Control Method
8382-105	2-Position, 6-Port	Level logic
8382-104	2-Position, 10-Port	Level logic
8382-102	2-Position, 10-Port	BCD & serial communication
8382-103	6-Position, 7-Port	BCD & serial communication

TITANHP™

To 6,000 psi (414 bar)

The TitanHP consists of an integrated driver/actuator and a removable liquid end in a space-saving design. These valves are available in multiple position/port configurations for flow path switching/injection/selection, and can incorporate a variety of materials for chemical and biocompatibility. Rapid Replacement Pods enable fast preventive maintenance.

An available Printed Circuit Board (PCB) for motor drive and valve control integrates easily into the instrument. OEM customers only need to provide the digital control signals and 24 V DC power in order to achieve random access actuation and position feedback. All valves may be controlled by BCD, I2C, UART, Pulse or Dual Pulse standards; two-position valves may also be controlled with level logic.



Part No.	Pressure	Positions	Ports	Passage Size	Internal Volume	Typical Flow Rate	Notes
SELECTED TITANHP VALVE SPECIFICATIONS — CONTACT FACTORY FOR ADDITIONAL OPTIONS							
MHP7980-000	0–5,000 psi	2	6	0.004" (0.10 mm)	28 nL	0.01–5 mL/min	For 1/32" tubing and M4 fittings
MHP9900-000	0–5,000 psi	2	6	0.012" (0.3 mm)	660 nL	0.25–5 mL/min	Switching/injection, metal-free flow path (wetted surfaces)
MHP7900-000	0–6,000 psi	2	6	0.012" (0.3 mm)	450 nL	0.25–5 mL/min	Switching/injection
MHP9960-000	0–5,000 psi	2	10	0.010" (0.25 mm)	500 nL	0.25–5 mL/min	Switching, metal-free flow path (wetted surfaces)
MHP7986-000	0–5,000 psi	2	10	0.004" (0.10 mm)	24 nL	0.01–5 mL/min	For 1/32" tubing and M4 fittings
MHP7960-000	0–6,000 psi	2	10	0.010" (0.25 mm)	500 nL	0.25–5 mL/min	Switching
MHP7970-000	0–6,000 psi	6	7	0.012" (0.3 mm)	450 nL	0.25–5 mL/min	Selection, dispensing, fractionation

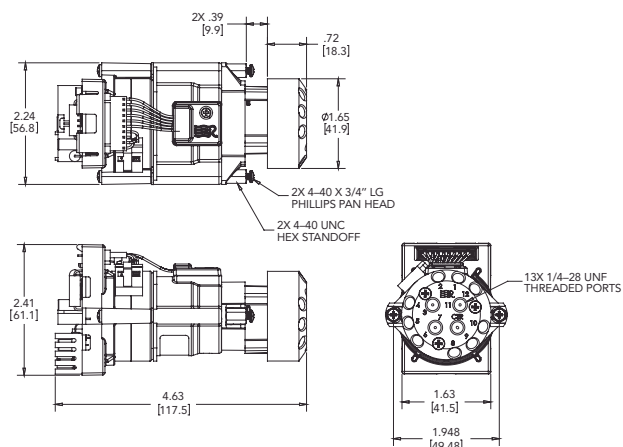
TitanHP (MHP valves) are offered with or without valve driver boards.

TITANEZ™

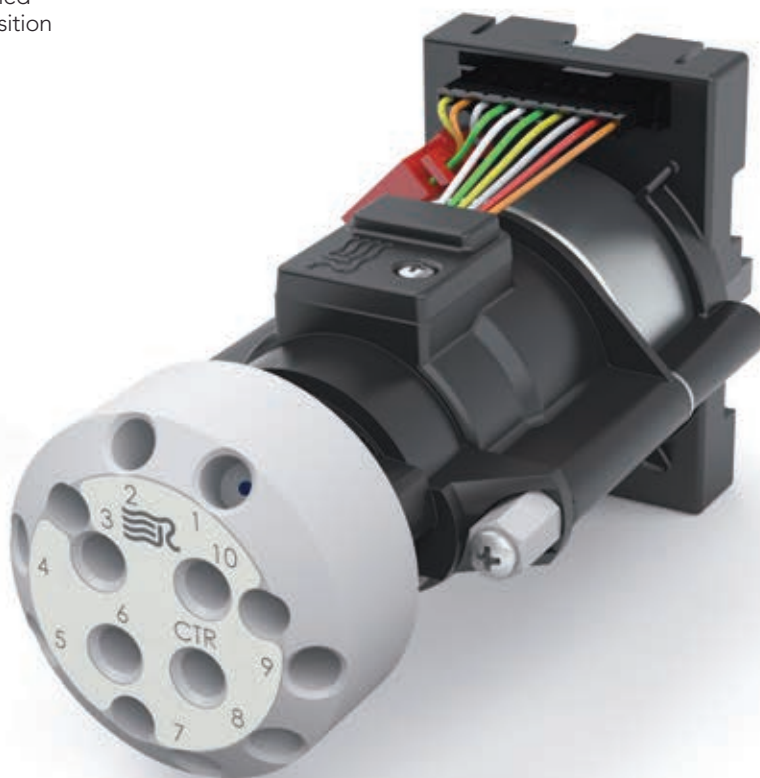
To 102 psi (7 bar)

Ultrahard sealing surfaces of the TitanEZ's rotors and stators create a flow path resistant to particulates. These ceramic-on-ceramic wear surfaces also provide longer life than similar polymer surfaces and are more resistant to particulate wear.

An optional driver board adds the functionality of motor drive and valve control, and shortens equipment manufacturers' time to market by eliminating the need for separate development of the control interfaces. OEM customers need only provide the digital control signals and 24 V DC power to achieve random access actuation and position feedback. All valves may be controlled by BCD, I2C, UART, Pulse, or Dual Pulse standards; two-position valves may also be controlled with level logic.



Manifold-Mount TitanEZ

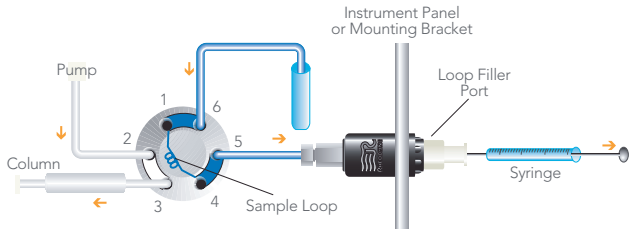


Part No.	Pressure	Positions	Ports	Passage Size	Internal Volume	Typical Flow Rate	Notes
SELECTED TITANEZ VALVE SPECIFICATIONS — CONTACT FACTORY FOR ADDITIONAL OPTIONS							
EZ450-000	0-102 psi (7 bar)	4	5	0.060" (1.52 mm)	24 µL	up to 1000 mL/min	Selection, dispensing, fractionation, etc. Metal free flow path (wetted surfaces)
EZ670-900-4	0-102 psi (7 bar)	6	7	0.060" (1.52 mm)	56 µL	up to 1000 mL/min	Selection, dispensing, fractionation, etc. Metal free flow path (wetted surfaces)
EZ011-820-4	0-75 psi (5 bar)	10	11	0.060" (1.52 mm)	76 µL	up to 1000ml/min	Selection, dispensing, fractionation, etc. Metal free flow path (wetted surfaces)
EZ1213-820-4	0-75 psi (5 bar)	12	13	0.040" (1.0 mm)	24 µL	up to 1000ml/min	Selection, dispensing, fractionation, etc. Metal free flow path (wetted surfaces)

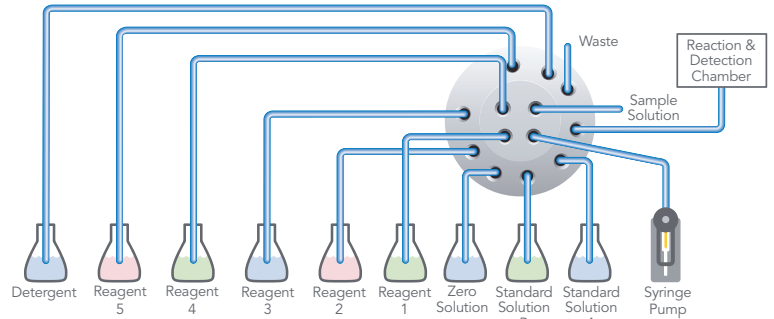
Options for direct mount to manifold are available.

IMPLEMENTATION EXAMPLES

Sample Injection using a Loop Filler Port

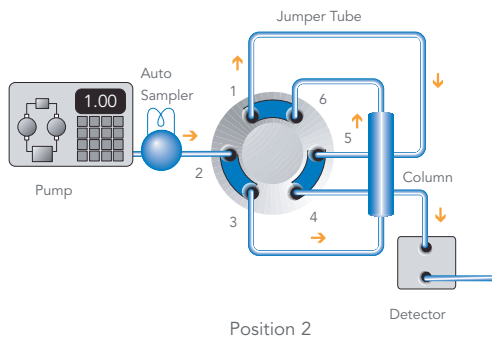
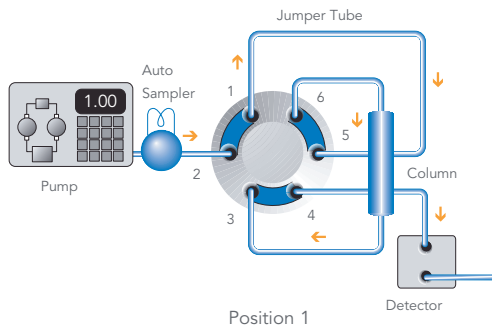


Reagent Dispensing

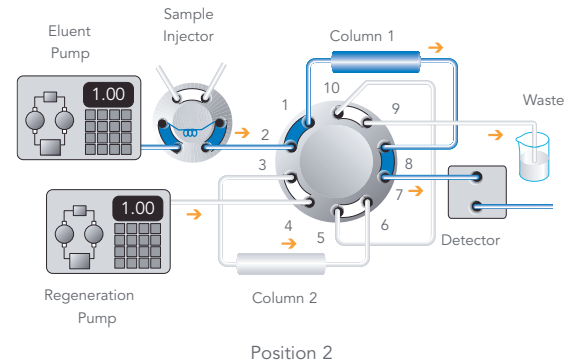
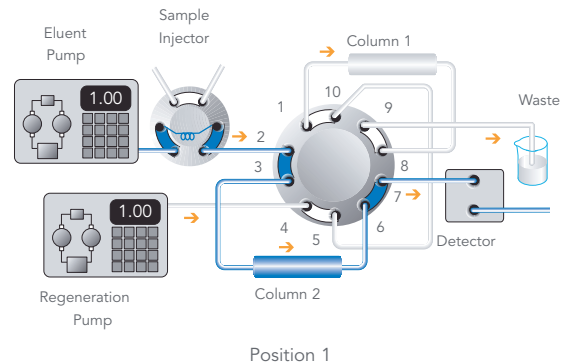


Typical water analysis instrument flow path. The TitanEZ selector valve enables precise, highly reliable reagent selection with low internal volume.

Backflushing



Column Regeneration



FOR OEMs

FLUIDIC MANIFOLDS

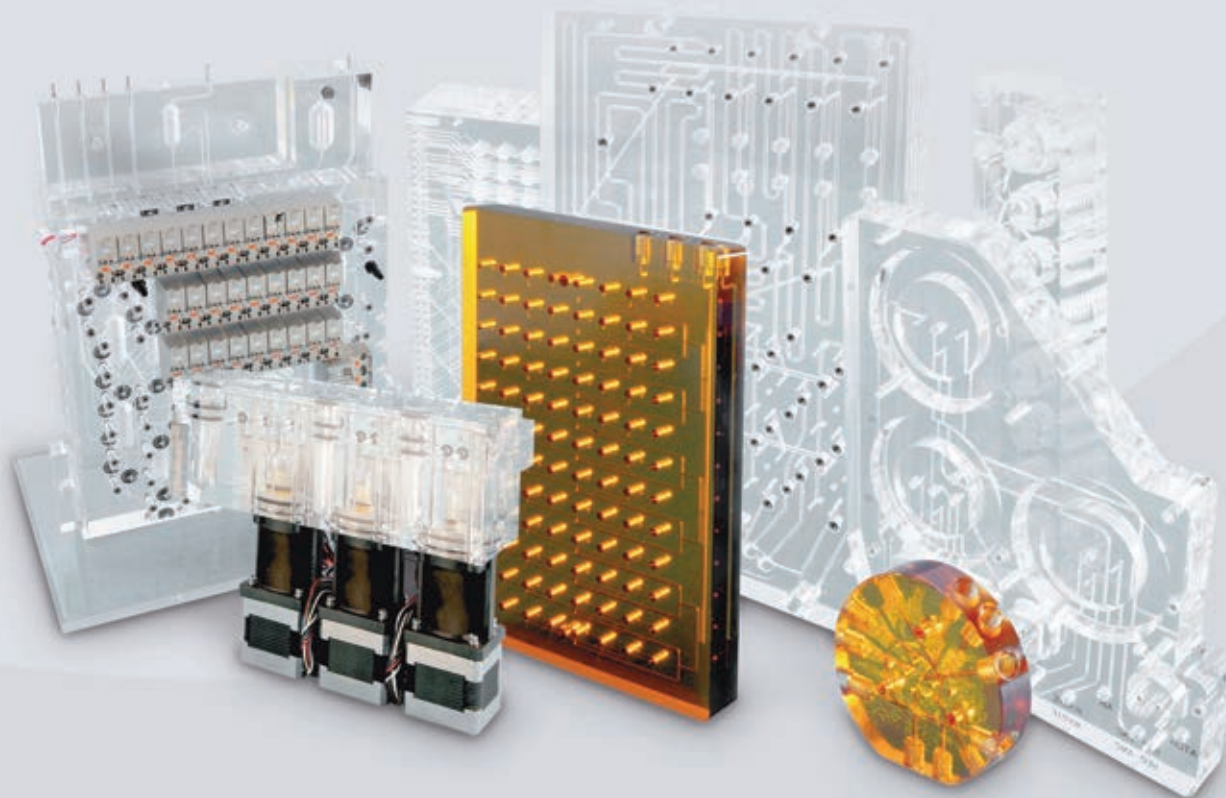
Traditionally used in advanced diagnostic and analytical instruments where fluids perform vital system tasks, manifolds route fluid pathways and integrate multiple components and functions in a single, compact, leak-free unit custom to the instrument.

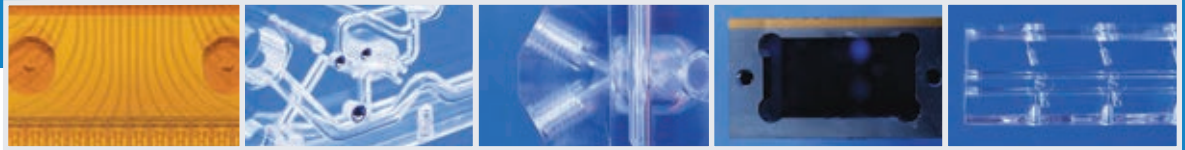
A manifold can:

- ▶ **Reduce reagent volume** and cost per test by creating the shortest, most compact flow path
- ▶ **Reduce total fluidic package size**, enabling a smaller instrument footprint
- ▶ **Reduce carryover and cross contamination** by eliminating unswept cavities
- ▶ **Reduce assembly costs** and increase ease of fluidic installations
- ▶ **Reduce periodic maintenance** with fewer, longer-lived components
- ▶ **Increase serviceability in the field**
- ▶ **Increase instrument precision** with reliably fixed, known internal volumes

Custom options:

- ▶ **Choice** of thermoplastics
- ▶ **Number** of layers
- ▶ **Fluid control components** such as pumps, solenoid valves, and rotary valves
- ▶ **Built-in features** like mixing chambers, debubbling chambers, and reservoirs
- ▶ **Detection components** such as flow cells
- ▶ **Integrated fluid heaters** to speed up reaction rates
- ▶ **Integrated sensors** to monitor and measure fluid flow, pressure, and temperature





Manifold Technology	Diffusion Bonding	Solvent Bonding	Adhesive Bonding	Thermal Bonding	Cross Drilled
Manifold Construction	Multilayer	Multilayer	Multilayer	Multilayer	Single Layer
Process Description	Application of heat, pressure, and time to molecularly bond layers together.	Application of a chemical solvent to bond layers together.	Application of an adhesive to bond layers together.	Application of thermal energy to weld layers together.	Drilled from outside of part to connect all flow paths.
Typical Materials	Acrylic (PMMA) Ultem® (PEI) Polycarbonate (PC) PolyVinyl Chloride (PVC)	Acrylic (PMMA) Ultem (PEI) PolyVinyl Chloride (PVC) Polysulfone (PSU) ABS	Most engineering plastics except fluoropolymers and polyolefins	Acrylic (PMMA), Ultem (PEI) Polypropylene (PP), Kynar® (PVDF) Polyfluoroalkoxy (PFA), Polycarbonate (PC) ABS, Polyethylene (PE), Polysulfone (PSU)	All Machinable Plastics
Typical Track Width/ Drill Hole Diameter	> 0.015" (0.38 mm) < 0.118" (3 mm) Track	> 0.079" (2 mm) Track	> 0.079" (2 mm) Track	> 0.015" (0.38 mm) Track	> 0.020" (0.5 mm) Hole
Track Configurations	3-D Curved Straight	3-D Curved Straight	3-D Curved Straight	3-D Curved Straight	Straight (Drilled)
Track Cross Section	Square track Round track "D" track*	Square track Round track "D" track*	Square track Round track "D" track*	Square track Round track "D" track*	Round
Manifold Technology Selection Guidelines	<ul style="list-style-type: none"> ▶ Best fluid flow performance ▶ Lowest carryover and unswept volumes ▶ Lowest dead volume 	<ul style="list-style-type: none"> ▶ Ideal for manifolds with larger tracks and features 	<ul style="list-style-type: none"> ▶ Broader bondable material selection ▶ Ideal for manifolds with larger tracks and features 	<ul style="list-style-type: none"> ▶ Capability to bond fluoropolymers and polyolefins plus the advantages of diffusion bonding 	<ul style="list-style-type: none"> ▶ Lowest cost manifold solution ▶ Offers the broadest range of material options
General Design Considerations	<ul style="list-style-type: none"> ▶ Consult our engineering experts at the start of your project for application, design, and DFMA assistance ▶ When selecting materials consider fluid compatibility, functional performance requirements, environmental conditions, manufacturability, and cost ▶ Reduce part count by integrating many discrete components onto the manifold such as valves, pumps, sensors, and fittings ▶ Consider field serviceability of manifold; placement of components on any manifold face that is accessible or a complete assembly replacement that offers plug and play modularity 				

Typical application pressures less than 100 psi (7 bar)

* "D" tracks are shaped in the form of letter D. Channel will be curved at the bottom and flat at the top.

CASE STUDIES

Genomic Customer Problem

Leak points in valve/tubing/fitting connections in their instrument and time consuming testing of these assemblies at their facility.

IDEX Design Engineers Solution

A fully integrated, multilayered Ultem® manifold assembly with surface-mounted valves that eliminates any potential leakage issues and arrives at the customer's facility fully assembled and tested.

Hematology Customer Goal

Reduce use of reagents and better integration between fluidics and other hardware.

IDEX Design Engineers Solution

A multilayer acrylic manifold with very short fluid paths that significantly reduced reagent use. Also, sensor electronics and incubation heating were incorporated into the manifold, which provide tight integration of the system.

INTEGRATED ASSEMBLIES AND CUSTOM FEATURES



Multilayer Diffusion Bonded Ultem Manifold



Valve Manifold Assembly



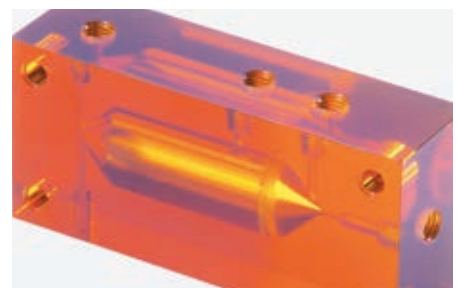
Pump Module Assembly



Manifold Mount Rotary Valves



Integrated Fluidic Manifold Assembly



Ultem Mixing Manifold

Cytometry Customer Problem

A large footprint fluid path that had very high dead volume and was difficult to service.

IDEX Design Engineers Solution

A single layer PEEK manifold, that significantly reduced the footprint of the fluidic path, eliminated dead volume and, for easy servicing, the manifold was designed with all the ports on the front face.

Immunoassay Customer Problem

Variability in accuracy of test results due to environment introduced electrical charges in the fluid path.

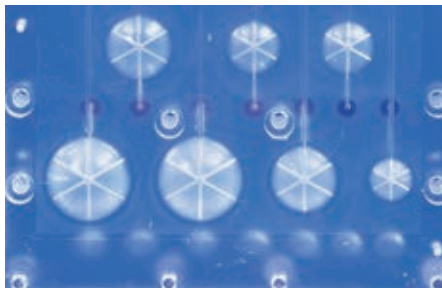
IDEX Design Engineers Innovation

A grounded fluid sleeve in line with a 0.040 inch ID sample fluid path that was fully integrated into the manifold design.

COMMON MATERIALS

Acrylic

- ▶ Optically clear
- ▶ Compatible with most IVD applications
- ▶ Strong and rigid
- ▶ Cost effective



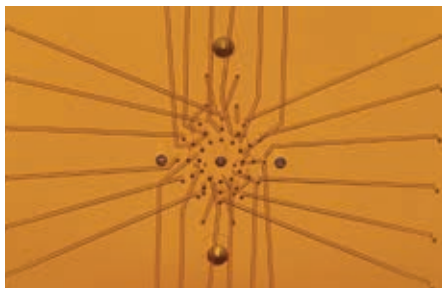
Kynar®

- ▶ High purity material
- ▶ Very high chemical resistance
- ▶ Very high temperature resistance



Ultem®

- ▶ Transparent
- ▶ Outstanding mechanical stability
- ▶ High chemical resistance
- ▶ High heat resistance



Delrin®

- ▶ Good balance of mechanical properties and cost effectiveness



PEEK

- ▶ Excellent mechanical strength
- ▶ Excellent chemical resistance
- ▶ Withstands high temperature
- ▶ Tough material



FOR OEMs

CUSTOM CONNECTIONS

HIGH PRESSURE FITTINGS

Very High Performance Fittings

The next generation in fitting technology offering maximum performance for the most demanding applications. Proven through testing and developed with a high safety factor to ensure robust connections.

- ▶ Re-usable or permanent configurations
- ▶ Features proprietary PEEK blend for high pressure and high temperature sealing
- ▶ Variety of threads and tubing sizes
- ▶ Full suite of torque tools to simplify assembly



Stainless Steel Fittings

Tried and trusted fittings for every application and port geometry. Features designs that reduce galling and lower installation torque.



LOW PRESSURE FITTINGS

Super Flangeless™ Fittings

A nut compresses a lock ring onto a ferrule which attaches to the end of the tube, sealing against the bottom of the port.

- ▶ Highest performance flat-bottom fitting
- ▶ Prevents twisting during installation
- ▶ Ferrule is retained on the tubing when removed from port



Flangeless Fittings

A nut and ferrule compress the OD of the tube to seal against the bottom of the port.

- ▶ Convenient — eliminates flanging
- ▶ Separate compression ferrule
- ▶ Easy to replace ferrule



Flanged Fittings

A nut and washer compress a flared tube against the bottom of the port.

- ▶ Simple, economical, functional
- ▶ No separate ferrule



Ask about the many custom options:

- ▶ Custom hardware, assemblies, and packaging
- ▶ Dedicated engineering support for design, development, and testing of OEM solutions
- ▶ Fast prototypes that shorten your development cycle
- ▶ How we extend our customer's engineering and manufacturing teams
- ▶ The many options that exist for materials suitable for bio-analytical applications.

For more details, see the **Fittings chapter (page 4)** and the **Tubing chapter (page 61)** of the **Laboratory Catalog!**



STAINLESS STEEL FORMED TUBING

Benefits:

- ▶ No tooling needed
- ▶ Develop prototypes very quickly
- ▶ Design changes are easy
- ▶ Value add kits, heat shrink, labels, fittings, etc.
- ▶ Consistently formed shapes, loops, and coils

UHPLC SS Tubing Assembly with VHP-200 Fittings and VHP-500 Inline Filter



POLYMER FORMED TUBING

Benefits:

- ▶ Formed tubing can provide strain relief and enhances the appearance of the instrument
- ▶ Calibrated and precision cut tubing available
- ▶ Quick-turn custom-formed tooling to meet your specifications

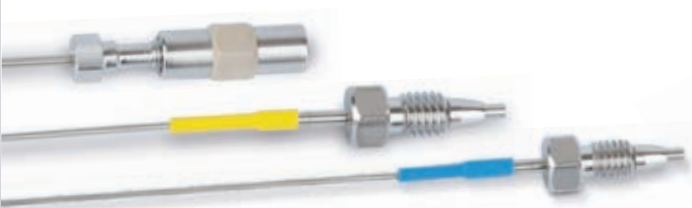
Spiralink PEEK, A-355 Biocompatible Inline Filter



HIGH PRESSURE TUBING ASSEMBLIES

Benefits:

- ▶ Built utilizing our most advanced fitting technology with high safety factors
- ▶ Built to your specifications -or- utilize our design team to develop the right solution for your applications
- ▶ Reduce installation time and simplify in-field service and consumable kits



*(Top) PLS Tubing with UP-700 BIO union;
(Center and bottom) UHPLC Flexible Tubing Assemblies.*

LOW PRESSURE TUBING ASSEMBLIES

Benefits:

- ▶ Engineered to deliver the right level of performance within your budget
- ▶ Provide logistical support to source and assemble your fluidic assemblies
- ▶ Special marking of tubing and assemblies for identification and tracking purposes



*(Top) Polymer Tubing Assembly with Flangeless Ferrule P-300;
(Bottom) Polymer Tubing Assemblies with spiral wrap and Super Flangeless Ferrule, P-259 Assemblies.*

FOR OEMs

COLUMN HARDWARE

IDEX Health & Science supplies custom column hardware to the world's leading column manufacturers. Protective column accessories and connection products that enhance column functionality are also available.

Explore the interactive column selector online at www.idexcolumnhardware.com.



BIOCOMPATIBLE COLUMN HARDWARE FOR UHPLC

IDEX Health & Science introduces the new PEEK-Lined Stainless Steel (PLS) Column for biocompatible applications. The PLS column combines the strength of our stainless steel UHPLC column (IsoBar) with the chemical inertness of PEEK polymer to ensure the integrity of bio-molecules by minimizing unwanted surface interactions while also allowing operation under harsh solvent or pH conditions. This hardware has been designed for demanding applications within the UHPLC realm.

- ▶ Some suggested applications: bio-molecule analysis, low pH applications, IC, bio-inert LC, bio-purification, harsh solvents, protein characterization
- ▶ Rated to 20,000 psi (1,379 bar) packing at RT/ 15,000 psi (1,034 bar) operating up to 80°C

Benefits

- ▶ Removable frit assemblies
- ▶ Excellent column durability over hundreds of injections
- ▶ Easy-to-pack column hardware
- ▶ Improved pressure handling capability over conventional PEEK column hardware



Part No.	Description	Qty.
UHPLC BIOCOMPATIBLE COLUMN SYSTEM		
5051IP-M07021-005-05TIX5	2.1 mm x 5.0 cm, 0.5 µm Titanium frit	5-pk
5051IP-M07021-010-05TIX5	2.1 mm x 10.0 cm, 0.5 µm Titanium frit	5-pk
5051IP-M07021-015-05TIX5	2.1 mm x 15.0 cm, 0.5 µm Titanium frit	5-pk
5051IP-M07021-025-05TIX5	2.1 mm x 25.0 cm, 0.5 µm Titanium frit	5-pk
5051IP-M12046-005-05TIX5	4.6 mm x 5.0 cm, 0.5 µm Titanium frit	5-pk
5051IP-M12046-015-05TIX5	4.6 mm x 15.0 cm, 0.5 µm Titanium frit	5-pk
5051IP-M12046-025-05TIX5	4.6 mm x 25.0 cm, 0.5 µm Titanium frit	5-pk
5051IP-M12046-030-05TIX5	4.6 mm x 30.0 cm, 0.5 µm Titanium frit	5-pk



ISOBAR COLUMN SYSTEMS

- ▶ Ultra-high performance liquid chromatography (UHPLC) compatible
- ▶ Proven format for < 2 µm stationary phases
- ▶ Rated to 20,000 psi (1,379 bar)

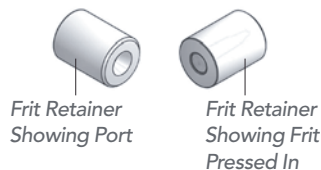
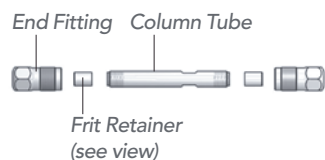
UHPLC decreases the time and cost associated with analytical separations, but to consistently maintain these technology advantages, you need column hardware that ensures the speed and precision of your processes. The IsoBar column platform delivers a leak-proof, reliable all-metal design with high strength threaded end fittings to meet critical system operating requirements.

Few column hardware formats are more aptly suited for the rigors of ultra-high pressure operations than IsoBar. IsoBar features a unique Isobore™ internal surface finish. This extremely smooth, flat, and ultra-clean finish can reduce the column “wall effect” and may improve column efficiency.

IsoBar offers the stability, high pressure, and high reliability critical to the optimum performance of UHPLC systems.

Dimensions

ID	2.1, 3.0, and 4.6 mm
Length	2.0, 2.5, 3.0, 5.0, 10.0, 15.0, and 25.0 cm



Part No.	Description
ISOBAR 4.6 MM	
5030IP-05046-002-05	IsoBar Column System, 4.6 mm x 2.0 cm, 0.5 µm
5030IP-05046-0025-05	IsoBar Column System, 4.6 mm x 2.5 cm, 0.5 µm
5030IP-05046-003-05	IsoBar Column System, 4.6 mm x 3.0 cm, 0.5 µm
5030IP-05046-005-05	IsoBar Column System, 4.6 mm x 5.0 cm, 0.5 µm
5030IP-05046-010-05	IsoBar Column System, 4.6 mm x 10.0 cm, 0.5 µm
5030IP-05046-015-05	IsoBar Column System, 4.6 mm x 15.0 cm, 0.5 µm
5030IP-05046-025-05	IsoBar Column System, 4.6 mm x 25.0 cm, 0.5 µm
2009-05046-002EP	IsoBar Column Tube, 4.6 mm x 2.0 cm
2009-05046-0025EP	IsoBar Column Tube, 4.6 mm x 2.5 cm
2009-05046-003EP	IsoBar Column Tube, 4.6 mm x 3.0 cm
2009-05046-005EP	IsoBar Column Tube, 4.6 mm x 5.0 cm
2009-05046-010EP	IsoBar Column Tube, 4.6 mm x 10.0 cm
2009-05046-015EP	IsoBar Column Tube, 4.6 mm x 15.0 cm
2009-05046-025EP	IsoBar Column Tube, 4.6 mm x 25.0 cm
907946-P-05	Assembly Frit Retainer, 4.6 mm Tapered, 0.5 µm
907946-P-10	Assembly Frit Retainer, 4.6 mm Tapered, 1.0 µm
907946-P-20	Assembly Frit Retainer, 4.6 mm Tapered, 2.0 µm
9096	End Fitting, IsoBar 5/16"
ISOBAR 3.0 MM	
5030IP-05030-002-05	IsoBar Column System, 3.0 mm x 2.0 cm, 0.5 µm
5030IP-05030-0025-05	IsoBar Column System, 3.0 mm x 2.5 cm, 0.5 µm
5030IP-05030-003-05	IsoBar Column System, 3.0 mm x 3.0 cm, 0.5 µm
5030IP-05030-005-05	IsoBar Column System, 3.0 mm x 5.0 cm, 0.5 µm
5030IP-05030-010-05	IsoBar Column System, 3.0 mm x 10.0 cm, 0.5 µm
5030IP-05030-015-05	IsoBar Column System, 3.0 mm x 15.0 cm, 0.5 µm
5030IP-05030-025-05	IsoBar Column System, 3.0 mm x 25.0 cm, 0.5 µm
2009-05030-002EP	IsoBar Column Tube, 3.0 mm x 2.0 cm
2009-05030-0025EP	IsoBar Column Tube, 3.0 mm x 2.5 cm
2009-05030-003EP	IsoBar Column Tube, 3.0 mm x 3.0 cm
2009-05030-005EP	IsoBar Column Tube, 3.0 mm x 5.0 cm
2009-05030-010EP	IsoBar Column Tube, 3.0 mm x 10.0 cm
2009-05030-015EP	IsoBar Column Tube, 3.0 mm x 15.0 cm
2009-05030-025EP	IsoBar Column Tube, 3.0 mm x 25.0 cm
907930-P-05	Assembly Frit Retainer, 3.0 mm Tapered, 0.5 µm
907930-P-10	Assembly Frit Retainer, 3.0 mm Tapered, 1.0 µm
907930-P-20	Assembly Frit Retainer, 3.0 mm Tapered, 2.0 µm
9096	IsoBar End Fitting, 5/16"
ISOBAR 2.1 MM	
5030IP-04021-002-05	IsoBar Column System, 2.1 mm x 2.0 cm, 0.5 µm
5030IP-04021-003-05	IsoBar Column System, 2.1 mm x 3.0 cm, 0.5 µm
5030IP-04021-005-05	IsoBar Column System, 2.1 mm x 5.0 cm, 0.5 µm
5030IP-04021-010-05	IsoBar Column System, 2.1 mm x 10.0 cm, 0.5 µm
5030IP-04021-015-05	IsoBar Column System, 2.1 mm x 15.0 cm, 0.5 µm
5030IP-04021-025-05	IsoBar Column System, 2.1 mm x 25.0 cm, 0.5 µm
2009-04021-002EP	IsoBar Column Tube, 2.1 mm x 2.0 cm
2009-04021-003EP	IsoBar Column Tube, 2.1 mm x 3.0 cm
2009-04021-005EP	IsoBar Column Tube, 2.1 mm x 5.0 cm
2009-04021-010EP	IsoBar Column Tube, 2.1 mm x 10.0 cm
2009-04021-015EP	IsoBar Column Tube, 2.1 mm x 15.0 cm
2009-04021-025EP	IsoBar Column Tube, 2.1 mm x 25.0 cm
907921-P-05	Assembly Frit Retainer, 2.1 mm Tapered, 0.5 µm
907921-P-10	Assembly Frit Retainer, 2.1 mm Tapered, 1.0 µm
907921-P-20	Assembly Frit Retainer, 2.1 mm Tapered, 2.0 µm
9097	IsoBar End Fitting, 1/4"
PACKING ADAPTER	
3160-05-46	IsoBar Assembly Packing Adapter, 4.6 mm
3160-005	Seal IsoBar Packing System, 4.6 mm
3160-05-30	IsoBar Assembly Packing Adapter, 3 mm
3160-004	Seal IsoBar Packing System, 3 mm
3160-04-21	IsoBar Assembly Packing Adapter, 2.1 mm
3160-007	Seal IsoBar Packing System, 2.1 mm

MODULAR COLUMN SYSTEMS

Modular hardware guarantees a high-pressure seal between the tubing and end fitting, as well as a proper seating of the frit. The frit is contained in a cap that slides over the column, forming a leak-free and gap-free seal. All stainless steel modular columns use our exclusive Isobore™ internal surface finish.

Modular column hardware systems include the following components: one 316 stainless steel column body, two one-piece end fittings, and two frit caps containing 316 stainless steel frits in a PEEK cap. In addition, Modular systems are available in custom IDs and lengths — many sizes are available.

- ▶ Operates at pressures up to 15,000 psi (1,034 bar)
- ▶ Precision machined from high purity LC grade 316 stainless steel

Part No.	Description	Port Geometry
MODULAR COLUMN SYSTEMS		
5041IV-04021-005-20	2.1 mm x 5.0 cm, 2 µm	Valco
5041IP-04021-015-20	2.1 mm x 15.0 cm, 2 µm	Parker
5041IV-04021-010-20	2.1 mm x 10.0 cm, 2 µm	Valco
5041IV-04021-015-20	2.1 mm x 15.0 cm, 2 µm	Valco
5041IP-04021-025-20	2.1 mm x 25.0 cm, 2 µm	Parker
5041IP-04021-0033-20	2.1 mm x 3.3 cm, 2 µm	Parker
5041IP-04021-005-05	2.1 mm x 5.0 cm, 0.5 µm	Parker
5041IP-05030-025-20	3.0 mm x 25.0 cm, 2 µm	Parker
5041IP-05030-015-20	3.0 mm x 15.0 cm, 2 µm	Parker
5041IP-05040-025-20	4.0 mm x 25.0 cm, 2 µm	Valco
5041IP-05040-025-20	4.0 mm x 25.0 cm, 2 µm	Parker
5041IP-05040-015-20	4.0 mm x 15.0 cm, 2 µm	Parker
5041IV-05040-0125-20	4.0 mm x 12.5 cm, 2 µm	Valco
5041IP-05041-025-20	4.1 mm x 25.0 cm, 2 µm	Parker
5041IP-05041-015-20	4.1 mm x 15.0 cm, 2 µm	Parker
5041IP-05041-010-20	4.1 mm x 10.0 cm, 2 µm	Parker
5041IV-05046-025-20	4.6 mm x 25.0 cm, 2 µm	Valco
5041IV-05046-015-20	4.6 mm x 15.0 cm, 2 µm	Valco
5041IP-05046-015-20	4.6 mm x 15.0 cm, 2 µm	Parker
5041IP-05046-025-20	4.6 mm x 25.0 cm, 2 µm	Parker
5041IV-05046-005-20	4.6 mm x 5.0 cm, 2 µm	Valco
5041IV-05046-020-20	4.6 mm x 20.0 cm, 2 µm	Valco
5041IV-05046-010-20	4.6 mm x 10.0 cm, 2 µm	Valco
5041IP-05046-010-20	4.6 mm x 10.0 cm, 2 µm	Parker
5041IP-08078-030-20	7.8 mm x 30.0 cm, 2 µm	Parker
5041IP-08078-015-20	7.8 mm x 15.0 cm, 2 µm	Parker
5041IP-08078-025-20	7.8 mm x 25.0 cm, 2 µm	Parker
5041IP-10100-025-20	10.0 mm x 25.0 cm, 2 µm	Parker
5041IP-10100-015-20	10.0 mm x 15.0 cm, 2 µm	Parker
5041IP-10100-010-20	10.0 mm x 10.0 cm, 2 µm	Parker

Note: More sizes are available, please contact us for more information.

MODULAR COLUMN PACKING ADAPTERS

Modular packing adapters are used to connect modular style column hardware to high pressure column packing reservoirs. The adapters feature a three-piece threaded design for safety and easy removal and replacement of the PEEK sealing ring. Modular packing adapters are available for inner diameters from 2.1 mm to 21.2 mm.



Part No.	ID (mm)
PACKING ADAPTER ASSEMBLY FOR MODULAR SYSTEMS	
3118-21	2.1 mm
3118-46	4.6 mm
3118-10	1.0 mm
3118-30	3.0 mm
3118-40	4.0 mm

FOR OEMs

DEGASSING

IDEX Health & Science offers equipment manufacturers three distinct degassing options to meet the varied environments of analytical, life science, and biotech laboratories.

DEBUBBLERS AND DEGASSERS

In high-pressure analyses — particularly HPLC and UHPLC — IDEX Health & Science vacuum degassers actively remove dissolved gases in liquids to prevent flow variations.

Debubblers work effectively in lower pressure instruments where formed bubbles displace system liquids.

HIGH-FLOW DEGASSERS

IDEX Health & Science high-flow degassers provide continuous degassing in high-throughput systems in diagnostic laboratories.



High-Flow Degasser

Degasser

Debubbler

APPLICATION NOTE

Why Degas Your Mobile Phase?

Dissolved air in HPLC mobile phases can result in flow rate instability and baseline disturbance.

Flow rate instability: Non-degassed mobile phase can outgas in the pump head, causing bubbles to be formed and trapped inside the head or check valves. These bubbles can cause flow disturbances and pressure fluctuations, resulting in flow rate instability.

Baseline disturbance: As the mobile phase passes through the column, it experiences a large pressure drop. Non-degassed mobile phase can outgas due to this pressure differential, causing air bubbles to form. Air bubbles passing through or lodging in the flow cell cause detection disturbances, exhibited as baseline noise.

Why Use a Degassing System?

Helium sparging is a common means of degassing HPLC solvents. This method has its drawbacks, however. Helium tanks are expensive and bulky, and solvent backup and contamination are concerns. In addition, helium sparging can change the composition of a premixed mobile phase over time, due to the difference in the evaporation rates of mobile phase components.

In contrast, the Degassing System has none of these drawbacks, and it is extremely fast and efficient at removing dissolved gases — more efficient than PTFE-based degassing systems.

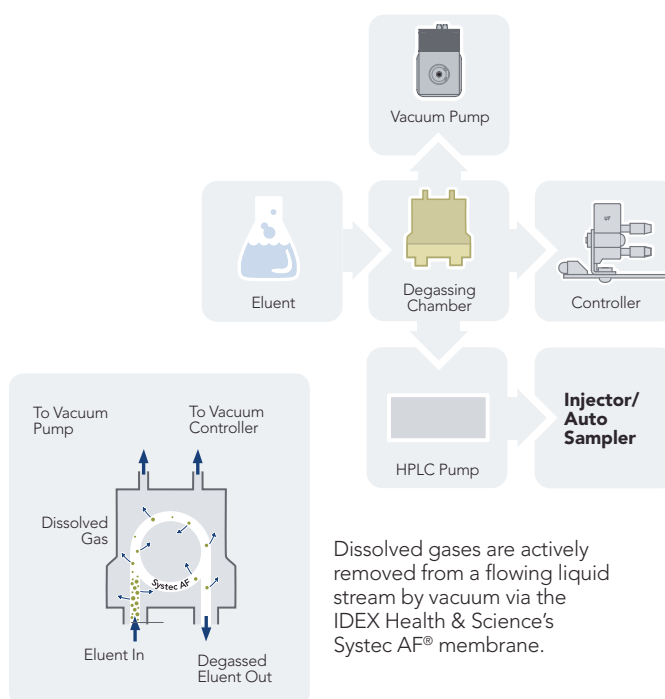
Tubing Connections

We recommend ETFE tubing be used to limit regassing of mobile phase between the degasser and your pump. ETFE is recommended because of its superior impermeability to gases (compared to PTFE, FEP, and PFA tubing). Find flangeless fittings in the fittings chapter of the Laboratory Catalog.

GPC and HFIP Applications

Standard degassing chambers, with PEEK bulkhead unions, are not recommended for GPC applications or for use with HFIP (hexafluoroisopropanol). Special GPC “hardened” versions are available. Please contact us for more information.

TYPICAL DEGASSER IMPLEMENTATION



Dissolved gases are actively removed from a flowing liquid stream by vacuum via the IDEX Health & Science's Systec AF[®] membrane.

OEM MINI

Degassing Module

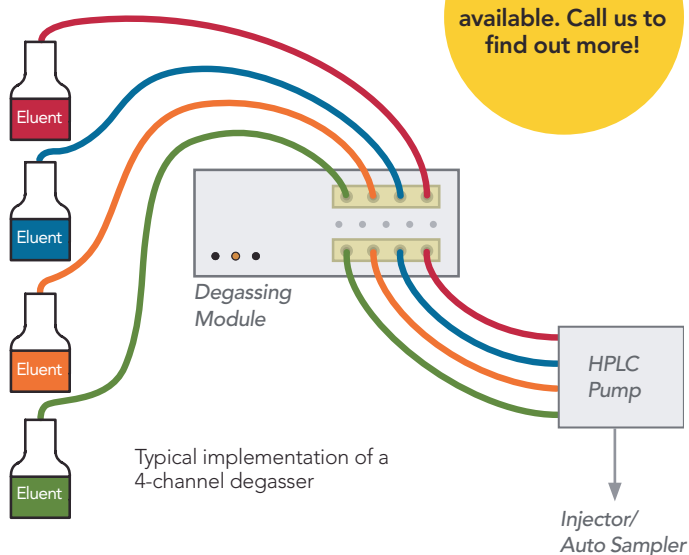
The OEM MINI Degassing Module is a state-of-the-art degassing module that is compact and ready for integration into virtually any existing LC pump, degassing tray, or stand-alone degassing application. This module is available with a CE-approved wall transformer and adapters for international power.

- ▶ Ultra-high degassing efficiency
- ▶ Low volume, easy to prime
- ▶ Patented control eliminates baseline fluctuations
- ▶ Single lumen design for consistent degassing
- ▶ Inert flow path
- ▶ 5+ year lifetime

ZHCR® Control with Built-in Test Diagnostics

- ▶ Microcontroller self-test vacuum sensor validation on power-up
- ▶ Continuous vacuum system monitoring to ensure optimum operational conditions are maintained
- ▶ Vacuum system fault detection and shutdown function indicators

IMPLEMENTATION



IDEX Health & Science's Systec AF™ / ZHCR Degassing Technology

Flow-through vacuum degassing chamber with a single amorphous perfluorinated copolymer (IDEX Health & Science's Systec AF) degassing membrane, enabling degassing efficiency 50 times that of PTFE, while maintaining the superb chemical inertness of fluorinated materials.

The ZHCR (Zero Hysteresis / Constant Run) vacuum pump employs a patented closed-loop, micro-stepping RPM control strategy permitting the pump to run with continuously variable speed, providing quick pull-down at high RPM, and then sustain a consistent vacuum level at low RPM.

Fluctuations in detector baseline due to changes in vacuum level are eliminated by not having to repeatedly stop and start a single-speed pump. This also greatly reduces wear and noise.

The brushless motor enables quiet operation and is appropriate for environments where solvent vapors may be present.

Part No.	No. of Channels	Channel Volume (μL)	Max HPLC Gradient Flow Capability ^c (mL/min)	Pressure Drop ^d (kPa/mL/min)	Degassing Flow Path ID (in/mm)
DEGASSING MODULE - AVAILABLE CONFIGURATION^{A,B}					
0001-6694	1	480	2.0	0.18	0.045/1.143
0001-6271	2	195	0.8	0.08	0.045/1.143
0001-6274	2	480	2.0	0.18	0.045/1.143
0001-6254	4	480	2.0	0.18	0.045/1.143
0001-6234	5	480	2.0	0.18	0.045/1.143

A. Custom configurations are available. Consult us for your own OEM solution to your specific application.

B. The standard MINI degassing chamber is not recommended for GPC applications (room temperature or heated), nor for use with HFIP (hexafluoroisopropanol). We offer a special GPC "hardened" version. Please consult the factory for details.

C. The flow rates given are for a gradient mixture of 50/50 MeOH/H₂O, with a typical low pressure gradient mixing valve. Higher flow rates are possible with high pressure mixing.

D. Estimated tubing pressure per unit change in flow assuming laminar flow with a viscosity of 1.0 cP.

ONLINE DEGASSERS

ERC-300W

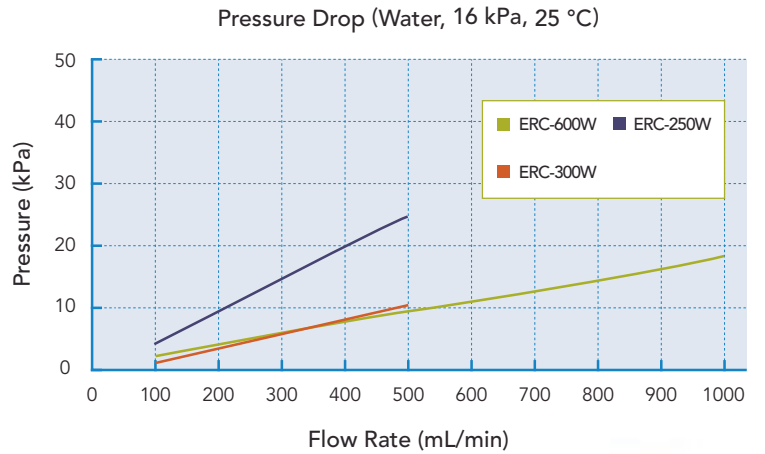
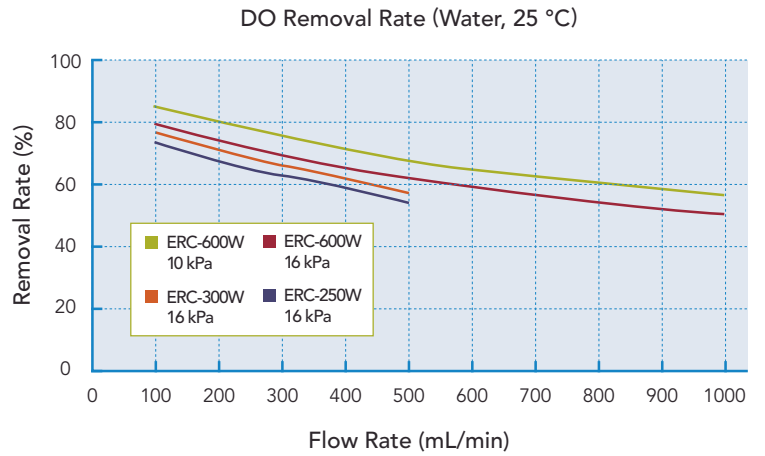
Increase dispense precision and save money by eliminating bubble related dispensing anomalies that interfere with calibration and sample results. The Integrated High-Flow Degasser is designed for long-life use in in-vitro diagnostic analysis systems.

Degas Module and Vacuum System

The reliable ERC-250W degas module and 767AY vacuum system degasses liquids in high-throughput applications to prevent bubble formation and improve dispense precision.

ERC-600W

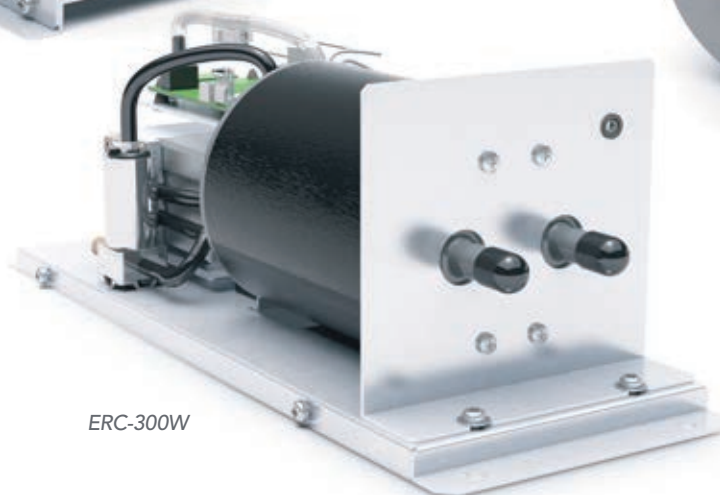
Non-porous membrane tubing makes the ERC-600W degas module the most robust, high-flow, low-pressure drop degasser on the market.



ERC-250W and 767AY



ERC-600W



ERC-300W

Name	ERC-300W	ERC-250W	767AY	ERC-600W
TECHNICAL DATA				
Product Configuration	Complete Degasser	Degassing Chamber	Vacuum Control Unit	Degassing Chamber
Maximum Flow Rate	500 mL/min (Water)	500 mL/min (Water)		1,000 mL/min (Water)
Dissolved O₂ Removal Rate	> 60% (300 mL/min)	> 60% (300 mL/min)		> 60% (500 mL/min)
Pressure Drop	< 10 kPa (300 mL/min)	< 18 kPa (300 mL/min)		< 10 kPa (500 mL/min)
Applicable Solvent	Deionized water, pure water, neutral buffer solvent	Deionized water, pure water, neutral buffer solvent		Deionized water, pure water, neutral buffer solvent
Maximum Pressure Rating	0.2 MPa	0.2 MPa		0.2 MPa
Vacuum Pressure			16 kPa	
Operation Ambient Temperature	2–45 °C	2–45 °C		2–45 °C
Wetted Materials	Silicone, PVC, NBR, PP	Silicon, PVC, NBR, PP		Silicon, PVC, NBR
Dimensions	W 115 × H 115 × D 330 mm	L 230 × Diameter 90 mm	W 106 × H 178 × D 230 mm	
Connector	Barb for ID 8 mm	IN/OUT: Barb for ID 8 mm low durometer tubing Vacuum: Barb for ID 3 mm low durometer tubing	Barb for ID 3 mm	IN/OUT: Barb for ID 8 mm low durometer tubing Vacuum: Barb for ID 3 mm low durometer tubing
Weight	3 kg	800 g	4 kg	1 kg
Flow Path Volume	60 mL	90 mL		200 mL
Power Supply	DC 24 V 12 W (max.)		AC 100 V 40 VA	
Part Number	00001213002	00001215002	00001903002	00001216002

REFRACTOMAX

The new RI Detector — RefractoMax —is a stable, reliable, and cost efficient detector that is ideal for saccharide analysis, GPC analysis for polymer, biodiesel analysis, UV absorption analysis, and preparative LC applications.



Name	RefractoMax524	RefractoMax521	RefractoMax522	RefractoMax523
TECHNICAL DATA				
Main Application	Micro-flow	Analytical	Semi-preparative	Preparative
Flow Rate Range	0.1 to 1 mL/min	1 to 5 mL/min	1 to 50 mL/min	50 to 200 mL/min
Instrument Color	Gray	Blue	Orange	Red
Flow Cell Volume	2.5 µL	8 µL	8 µL	8 µL
Maximum Back Pressure			50 kPa	
Flow Cell Type			2 chamber type	
Measuring Method			Deflection type	
Temperature Control			30 to 55 °C (1 °C step)	
Refractive Index Range			1.00 – 1.75	
Measuring Range	0.25 to 512 µRIU			2.5 to 5120 µRIU
Linearity Range	600 µRIU			6000 µRIU
Drift	0.2 µRIU/h			2 µRIU/h
Noise	2.5 nRIU (response: 1.5 sec)			25 nRIU (response: 1.5 sec)
Response		0.1, 0.25, 0.5, 1, 1.5, 2, 3, 6 sec		
Auto Zero		Full auto zero		
Auto Zero Range		All range		
Offset Range		0 to 500 mV (10 mV step)		
Recorder Output		0 to 10 mV/FS		
Integrator Output (Sensitivity)	DC 0 to 1 V (2 mV/µRIU, 8 mV/µRIU)			DC 0 to 1 V (0.2 mV/µRIU, 0.8 mV/µRIU)
External Output	(1)READY, (2)LEAK, (3) ERROR (OVER HEAT / LOW LIGHT INTENSITY / NULL GLASS HOME POSITION / LOST PARAMETERS / OPTICAL BALANCE) (contact capacity: DC 24 V 0.1 A max.)			
Communication Port	RS232C			
Wetted Materials	SUS316, Teflon, Quarts glass			
Dimension And Weight	H 150 x W 260 x D 450 mm, approx. 12 kg			
Power Supply	AC 100 to 240 V +/- 10% 50/60 Hz, 120 VA max.			
Part Number	00001331002	00001335002	00001334002	00001333002