



**optimize technologies**  
Innovative HPLC, UHPLC & LC/MS products

optimize

We are continually developing new products to meet the needs of our customers. For the most up-to-date selection of Optimize products and literature, please visit [www.optimize-tech.com](http://www.optimize-tech.com).



**optimize** technologies

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Optimize Technologies is dedicated to providing the highest quality HPLC, UHPLC and LC/MS products available. We combine innovative design and superior performance to create products that are straight forward, yet elegant, solutions to daily issues in the lab.

For example, the new **EXP**<sup>®</sup> product family provides reusable hand-tight connections and cartridge replacement for UHPLC pressures of 20,000+ psi. The **optilynx** system provides low-dispersion quick-connect capabilities for many applications rated to 6,000 psi. Our piston seals employ unique polymer blends to provide the ultimate performance. Check valve ball and seat sets are perfectly mated and feature optimized geometry for the fastest response time and flawless operation.

We are constantly developing new products and expanding existing offerings. Please contact us if you have a custom design requirement or need support with your scientific instrumentation. Optimize welcomes the opportunity to provide custom design and engineering solutions.

We promise to bring you innovative products that offer unmatched performance, quality, and ease of use - all backed with the most responsive and effective customer service in the industry.

## optimize service

How can we help you?

At Optimize, we take customer satisfaction seriously. Our products are only as good as the support we provide. Customer service is not just a department, but an integral part of our business. Our sales and quality assurance professionals, technical support specialists, machinists, engineers, chemists, and administrative team are available to provide answers to your questions.

Contact us directly or find your local authorized dealer at [www.optimize-tech.com](http://www.optimize-tech.com). Optimize is always here to back you up.

## our guarantee

Every component and product is designed to offer optimal performance and to meet or exceed original equipment specifications. Every Optimize product carries our full guarantee. For more information, please see page 83.

## Thank you for your business.



Mt. Hood is located 55 miles east of **optimize** technologies.

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# optimize manufacturing



## PRECISION MACHINING

Optimize products are manufactured by skilled machinists at our facility in Oregon City, Oregon. To meet our exacting standards for quality and reliability, our designs push the limits of manufacturing tolerances. To achieve these dimensional tolerance controls, **we individually machine components and avoid mold-based manufacturing techniques.** We ensure the consistency of our manufacturing process with a rigorous quality control program.



## THE DRIVING FORCE

Innovation started Optimize and innovation continues to fuel our progress. The spirit of Optimize is exemplified by products such as the Auto-Adjusting Stem, Hand-Tight EXP® hardware rated to 20,000psi, Opti-Max® check valve components, and the Opti-Lynx™ quick-connect system. We push the limits of excellence in everything we create.

## RESEARCH & DEVELOPMENT

At Optimize Technologies we are obsessed with Research and Development. It's hard not to be when we define and pride ourselves on continual progress. Our team of engineers and chemists are constantly engaging in the evaluation of existing product designs and the conceptualization of new ones. Our many collaborative efforts with various original equipment manufacturers (OEMs) and pharmaceutical research companies have resulted in customized components and devices for a variety of unique applications, increasing our experience beyond the realm of HPLC.

# custom design & manufacturing

## SPECIFIC NEEDS, SPECIFIC RESULTS

Team with Optimize Technologies to bring your ideas to reality. From simple one-piece fittings to entire fluid handling assemblies- no project is too small or too large. Optimize specializes in custom design and development services including packed-bed products, quick-connect technology and complex fluid handling devices. Offering patented features such as EXP®, Opti-Lynx™ and Opti-Solv®, we are able to customize our existing products or can design new solutions from the ground up to meet your specifications.

Virtually all manufacturing and design takes place in the USA. On-site engineering and manufacturing allows us to make rapid changes during the production process to meet the immediate needs of our customers. Highly experienced machinists bring to life the innovations created by our team of design specialists, engineers, and chemists. Our quality assurance professionals, who have an established reputation for being the most demanding in the field, ensure all Optimize products meet or exceed the highest standards in the industry.



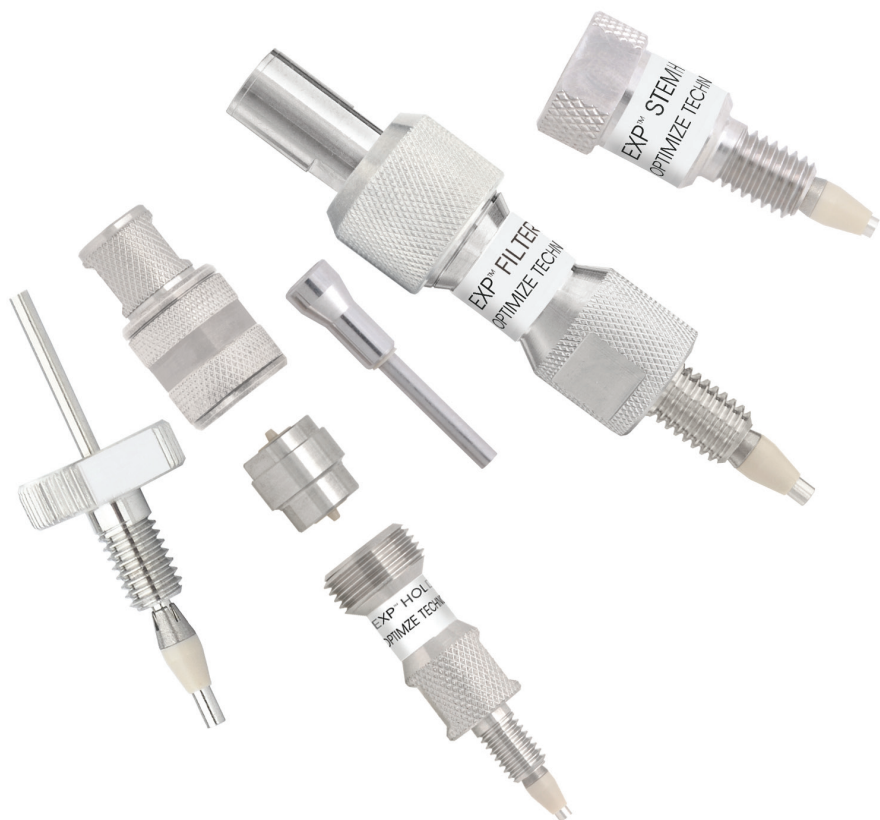
Custom packed Opti-Lynx™ trap and Opti-Solv® filtration application at the Pfizer Lab.

Some of the industries we serve:

- Chromatography
- Drug Discovery
- Mass Spectrometry
- Nuclear Pharmacy
- Clinical
- Environmental
- Petrochemical
- Bio-Defense
- Pharmaceuticals

## optimizepartners see what our customers are saying...

Our partnerships continue to benefit a variety of companies and customers with diverse applications. Now more than ever, Optimize is the perfect partner to adapt existing designs to specific applications, engineer solutions for problematic situations, and create innovative products. To see what our customers are saying, please visit our website, [www.optimizeotech.com/testimonials](http://www.optimizeotech.com/testimonials).



Introducing EXP<sup>®</sup>  
the new gold standard of  
extreme pressure chromatography  
hardware and consumables.

UHPLC

## extreme pressure



Welcome to the new gold standard of ultra high pressure liquid chromatography (UHPLC) hardware and consumables. Optimize Technologies' EXP product family includes fittings, filters and packed-bed products which offer unparalleled convenience and ease of use through exciting new patented and patent-pending innovations. This advanced system is the first design to provide reusable hand-tight connections and hand-tight cartridge replacement for UHPLC. These innovations significantly accelerate challenging UHPLC applications and reduce costly instrument downtime.

Revolutionary features include:

- EXP titanium/PEEK hybrid ferrule offering repeated zero-dead-volume connections, hand-tight to 8,700 psi or wrench-tight to 20,000 psi (1,400+ bar).
- EXP holders and cartridges with ultra-low internal swept volume and hand-tight cartridge changeover for use to 20,000 psi (1,400+ bar).

This rare combination of attributes enables our EXP components to provide excellent protection with negligible impact on analyte retention and peak symmetry. The elegant design of our EXP line showcases sleek architecture for easy installation in restricted instrument compartments, without compromising accessibility. Our commitment to exceed industry standards yields an entire EXP product family conservatively rated to 20,000+ psi (1,400+ bar). The EXP product line, as well as virtually all Optimize products, are proudly designed and manufactured in our facility in Oregon, USA\*.

From the name you've trusted for 25 years of precision innovation in HPLC accessories and consumables, EXP represents the culmination of a generation of research and development. High standards consistently guarantee that every product bearing the EXP trademark exemplifies our quality control, responsive customer service and expert technical support. Optimize is always here to back you up.

\* 100% of all Optimize **EXP** products are made in the U.S.A. from raw materials originating in the U.S.A.  
98% of all Optimize products are made in the U.S.A. from raw materials originating in the U.S.A.



## The Foundation of the EXP Family

Optimize Technologies recognizes the challenges faced by scientists and technicians in the constantly evolving field of chromatography and LC instrumentation. Ultra high pressure liquid chromatography is one example of how these advances present an opportunity for innovative products.

In response to evolving UHPLC technologies, Optimize delivers with the EXP Titanium PEEK Hybrid ferrule. The ingenuity of the EXP ferrule lies in a design which adjusts to any 10-32 port depth and can subsequently be removed and reused in a different port while still maintaining adjustability. The EXP ferrule provides the necessary zero-dead-volume seal to allow connections beyond 20,000+ psi (1,400+ bar).

The EXP ferrule, with its innovative capabilities, forms the foundation of our EXP product family. A quick look through these pages shows that the EXP ferrule is incorporated into the entire EXP product line, demonstrating its wide array of applications. If you are interested in seeing how our EXP products can work for you, please contact Optimize Technologies or one of our authorized dealers. At Optimize, we strive to develop new products that are straight forward, yet elegant, solutions to daily issues in the lab.

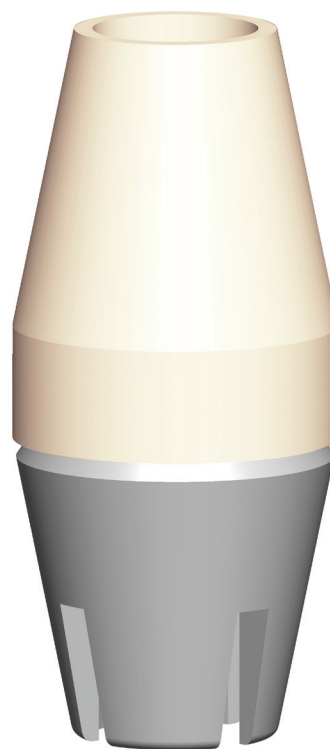
### ADVANTAGES OF THE EXP FERRULE

- Rated to 20,000+ psi (1,400+ bar)
- Tested to 30,000 psi
- Auto-adjusting ZDV connection
- Intended for many repeat uses
- No more cut-off and replacement of swaged ferrules



actual size

## A Perfect Seal with every connection



### PEEK:

Proven sealing ability beyond 20,000 psi (1,400 bar).

### Titanium:

Enables the swage to be released and reset. Intended for many repeat connections.

Patents Pending



# EXP fitting system

The EXP Fitting System is the premier adjustable nut and ferrule compression fitting for extreme high-pressure connections between 1/16" tubing and any 10-32 port. The key advantages of the EXP fitting lie at the confluence of simplicity and versatility.

The patent-pending Titanium Hybrid Ferrule integrates the resilience of titanium with the proven sealing ability of PEEK in a superb one-piece design. The Hybrid Ferrule provides a perfect seal with every connection, yet the swage can be released without tools to adjust to the different port depths of various hardware. This adjustability provides unlimited value through repeated zero-dead-volume connections with any 10-32 port configuration.

With the EXP Fitting System, you no longer have to clip off and replace swaged ferrules or wonder if you are achieving the best possible connection.

## ADVANTAGES OF EXP FITTINGS

- Available in hand-tight & wrench-tight configurations
- Rated to 20,000+ psi (1,400+ bar)
- Tested to 30,000 psi
- Auto-adjusting ZDV connection
- Intended for many repeat uses

### EXP Titanium Hybrid Ferrules

15-24-03831	Titanium Hybrid Ferrule
15-24-03832	Titanium Hybrid Ferrules, 10/Pk

### HAND-TIGHT EXP Fittings

15-20-03888	10-32 Hand-Tight Nut & Titanium Hybrid Ferrule
15-20-03930	10-32 Hand-Tight Nuts & Titanium Hybrid Ferrules, 10/Pk

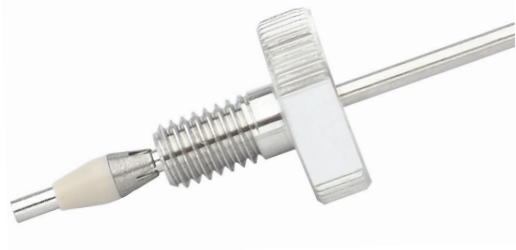
### HEX HEAD EXP Fittings

15-20-04120	10-32 Standard Hex Head Nut & Titanium Hybrid Ferrule
15-20-03839	10-32 Hex Head Nut, Short
15-20-03840	10-32 Short Hex Head Nuts & Titanium Hybrid Ferrules, 10/Pk
15-20-03833	10-32 Hex Head Nut, Standard
15-20-03834	10-32 Standard Hex Head Nuts & Titanium Hybrid Ferrules, 10/Pk
15-20-03841	10-32 Hex Head Nut, Long
15-20-03842	10-32 Long Hex Head Nuts & Titanium Hybrid Ferrules, 10/Pk

### HAND-TIGHT EXP Coupler

15-20-04128	1/16" OD x 0.005" ID x 5 cm Stainless Steel Tubing (Includes 2 EXP Hand-Tight Fittings)
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**HAND-TIGHT**  
hand-tight to 8,700+ psi  
wrench-tight to 20,000+ psi



**HEX HEAD**  
rated to 20,000+ psi



Patents Pending

## EXP stem filter

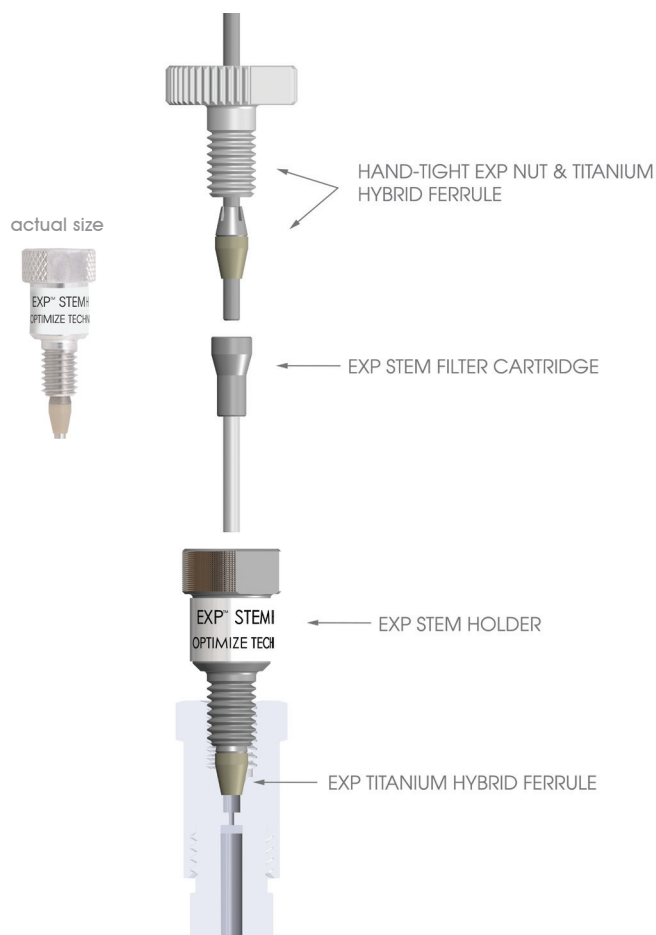
Modern UHPLC and UHPLC/MS instrumentation pushes the envelope in fluid handling with tiny passages and extremely high pressures. At any time, an unprotected system is virtually a stray 1 $\mu$ m seal fragment away from failure, loss of priceless data continuity and subsequent troubleshooting and repair. The best assurance against this costly prospect comes from safeguarding your system with thorough filtration.

The EXP Stem Filter features a choice of frit porosities integrated with our patented auto-adjusting stem for repeated ZDV connections with any 10-32 port. The entire filter stem and reusable holder are only slightly larger than a standard HPLC fitting. This slim architecture allows it to easily fit into crowded instrument compartments, tightly spaced injection ports, and anywhere else you need an extra level of protection against clogging and contamination. The EXP Stem Filter is an ideal solution to protect expensive UHPLC columns, injectors, autosamplers, and MS electrospray tips without extra-column effects.

When tightened by hand, the EXP Stem Filter seals to 8,700+ psi. The reusable holder hardware also incorporates wrench flats to enable flawless sealing to 20,000+ psi (1,400+ bar). The EXP Stem Filter is the ultimate low-impact protection for expensive UHPLC and MS equipment, assuring trouble-free performance so you can concentrate on the data, not troubleshooting.

### ADVANTAGES OF EXP STEM FILTERS

- Approved for use at 20,000+ psi (1,400+ bar)
- Hand-tight and wrench-tight configuration
- Reusable holder intended for many repeat uses
- Auto-adjusting ZDV connections
- Low-dispersion cartridges
- Custom volumes/porosities available
- Ultra-low .27  $\mu$ L total swept volume



#### EXP Stem Filter Kit

15-04-04122 0.2  $\mu$ m, EXP Stem Filter Kit

15-04-04123 0.5  $\mu$ m, EXP Stem Filter Kit

Includes: Holder, 3 Stem Filter Cartridges and Fittings

#### EXP Stem Filter Cartridges

15-04-04117 0.2  $\mu$ m, EXP Stem Filter Cartridge, 5/Pk

15-04-04119 0.5  $\mu$ m, EXP Stem Filter Cartridge, 5/Pk

U.S. Pat. No.s 5,525,303; 5,730,943; 5,911,954  
and other U.S. and foreign patents pending.

# EXP pre-column filter

The EXP Pre-Column Hand-Tight Filter is ideal for protecting small-particle UHPLC columns at extreme pressures. Such techniques analyze samples in the most demanding applications, which can decrease the life of these expensive columns. EXP Pre-Column Filters help extend that life and protect your column investment without sacrificing performance. Free-turn® architecture allows the user to change cartridges by hand without breaking fluid connections on the holder inlet/outlet.

EXP Pre-Column Filter holders are available with Titanium Hybrid ferrules for easy direct connection to any 10-32 port. The filter holder comes as a complete package including fittings to provide repeated zero-dead-volume column connections.

## ADVANTAGES OF EXP PRE-COLUMN FILTERS

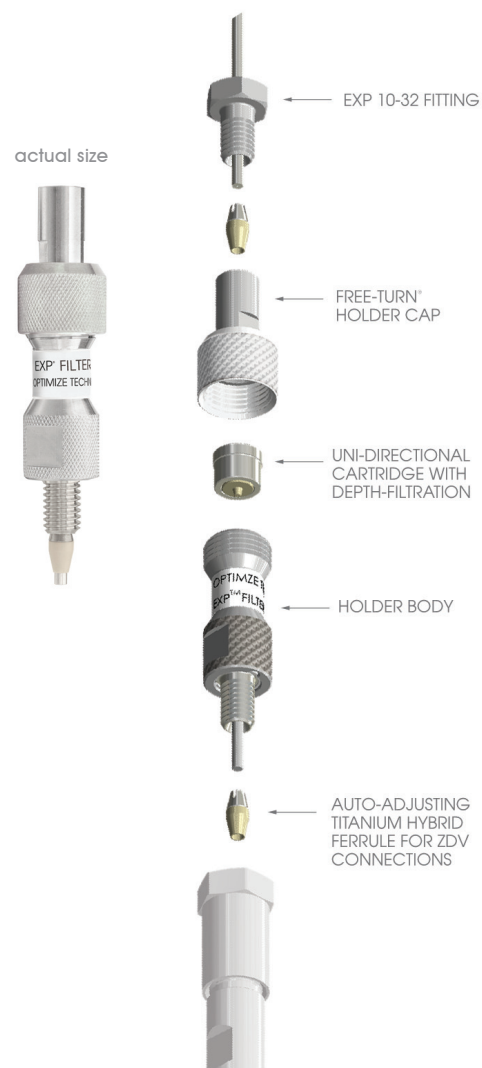
- Approved for use at 20,000+ psi (1,400+ bar)
- Hand-tight filter replacement - NO TOOLS!
- Depth filtration maximizes capacity
- Auto-adjusting ZDV column connection
- Custom volumes/porosities available
- Low-volume, low-dispersion cartridges
- Hardened stainless steel end cap eliminates galling

### EXP Pre-Column Filter Holder

**15-04-03837** EXP Pre-Column Filter Holder  
(Fittings Included)

### EXP Pre-Column Filter Cartridges

<b>15-04-03093</b>	0.5 $\mu\text{m}$ , EXP Filter Cartridge, 5/Pk
<b>15-04-03096</b>	0.2 $\mu\text{m}$ , EXP Filter Cartridge, 5/Pk
<b>15-04-03094</b>	0.5 $\mu\text{m}$ , EXP Filter Cartridge, 10/Pk
<b>15-04-03097</b>	0.2 $\mu\text{m}$ , EXP Filter Cartridge, 10/Pk



U.S. Pat. No.s 5,525,303; 5,730,943; 5,911,954  
and other U.S. and foreign patents pending.

## EXP stem traps

The entire EXP Stem Trap and reusable holder are only slightly larger than a standard HPLC fitting. Its slim architecture allows it to easily fit into crowded instrument compartments or to connect directly to tightly-spaced injection ports. When tightened by hand, the EXP Stem Trap seals to 8,700+ psi. All configurations incorporate wrench-flats to enable flawless sealing to 20,000+ psi (1,400+ bar). The unique packed floating stem installs directly into any 10-32 port and automatically adjusts to provide a perfect ZDV connection.

Our specialized features, patented technology, precision engineering, and state-of-the-art manufacturing make the new EXP Stem Trap an unbeatable choice for Ultra High Pressure trapping applications.

### ADVANTAGES OF EXP STEM TRAPS

- Hand-tight and wrench-tight configurations
- Intended for many repeat uses
- Auto-adjusting ZDV connection
- Rated to 20,000+ psi (1,400+ bar)
- Custom packing available
- Bed volumes from 0.17  $\mu$ L to 2.6  $\mu$ L
- Low-volume, low-dispersion cartridges

EXP Stem Trap Kit



### EXP STEM TRAP KIT / REPLACEMENT STEM SELECTION GUIDE

	Bed Volume	Suggested Max Load Rate**	Dimensions	Dimension Code	Phase Code	Phase	
Stem Trap Kit	0.17 $\mu$ L	60 $\mu$ L/min	0.13 x 13.5mm	0 3 9 9 7	H A	C18	2.7 $\mu$ m HALO
Replacement Stems*	0.17 $\mu$ L			0 3 9 9 2	H B	C8	
Stem Trap Kit	0.33 $\mu$ L	120 $\mu$ L/min	0.18 x 13.5mm	0 4 0 0 3	H D	HILIC	
Replacement Stems*	0.33 $\mu$ L			0 4 0 0 1	H E	RP-Amide	
					H F	Phenyl-Hexyl	
Stem Trap Kit	0.68 $\mu$ L	250 $\mu$ L/min	0.25 x 13.5mm	0 4 0 0 9	H N	Peptide ES-C18	3 $\mu$ m EXP
Replacement Stems*	0.68 $\mu$ L			0 4 0 0 8	H G	C18	
Stem Trap Kit	1.5 $\mu$ L	500 $\mu$ L/min	0.36 x 13.5mm	0 4 0 1 5	H H	C8	
Replacement Stems*	1.5 $\mu$ L			0 4 0 1 4	H I	C4	
Stem Trap Kit	2.6 $\mu$ L	1mL/min	0.51 x 13.5mm	0 4 0 2 1	H J	HILIC	
Replacement Stems*	2.6 $\mu$ L			0 4 0 2 0	H K	Phenyl-Hexyl	
					H L	SAX	
					H M	SCX	
					E S	Custom	

15- 0 3 9 9 7 - H A  
Part Number

For bed volume and phase requirements, please refer to the selection guide on the right. Custom packing is also available, please contact us for details.

**Example:** a three pack of 0.17  $\mu$ L Stem Traps packed with HALO<sup>®</sup> C8 would have part number 15-03992-HB.

### Additional EXP Stem Holders

**15-02-03996** EXP Stem Holder (Fittings Included)



\* Includes 3 replacement stems. To be used with reusable EXP Stem holder only.

\*\* Suggested max load rate is based on 60/40 Acetonitrile/Water mobile phase.

U.S. Pat. No.s 5,525,303; 5,730,943; 5,911,954 and other U.S. and foreign patents pending.



# EXP trap columns

The patent-pending Hand-Tight EXP Trap Column is rated for use at 20,000+ psi (1,400+ bar). This unique design connects directly to any injection valve (with 10-32 threads) or in-line with 1/16" stainless tubing for unparalleled convenience and efficiency.

The EXP Cartridge System enables chemists to quickly remove detergents or salts which can affect the ionization process in MS work. This trapping technique can concentrate the sample directly on-line, allowing for increased recovery of precious sample material compared to off-line techniques. On-line trapping readily lends itself to automation for high-throughput analysis in UHPLC/MS applications. Free-turn® architecture allows the user to change cartridges by hand without breaking fluid connections on the holder inlet/outlet.

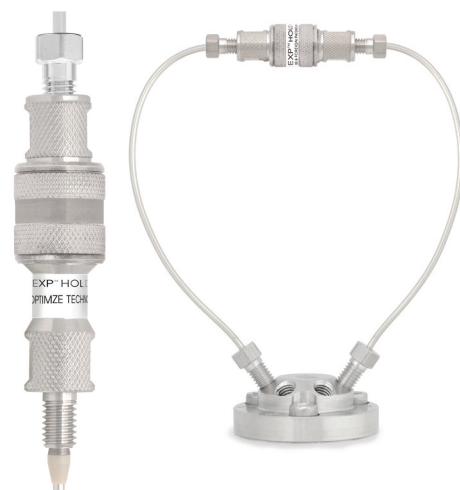
Our specialized features, patented technology, precision engineering, and state-of-the-art manufacturing make the new EXP Trap Column an unbeatable choice for Ultra High Pressure trapping applications.

## ADVANTAGES OF EXP TRAP COLUMNS

- Hand-tight trap replacement - NO TOOLS!
- Rated to 20,000+ psi (1,400+ bar)
- Uni-directional cartridge
- Auto-adjusting ZDV connections
- Custom packing available
- Bed volumes from 4  $\mu$ L to 100  $\mu$ L
- Hardened stainless steel end cap eliminates galling

EXP Direct Connect Holder

EXP In-Line Holder



actual size

### EXP Holders

15-02-03956	EXP Direct-Connect Holder (Fittings Included)
15-02-03946	EXP In-Line Holder (Fittings Included)
15-02-04041	EXP All-In-One Holder Kit (Includes: In-Line and Direct-Connect Holder Components)

For bed volume and phase requirements, please refer to the selection guide on the right. Custom packing is also available, please contact us for details.

**Example:** a three pack of 4  $\mu$ L Cartridges packed with HALO® C8 would have part number 15-03964-HB.

### EXP TRAP CARTRIDGE SELECTION GUIDE

	Bed Volume	Suggested Max Load Rate*	Dimensions	Dimension Code	Phase Code	Phase	
3 PACKS	4 $\mu$ L	2mL/min	1.0 x 5mm	0 3 9 6 4	HA HB HD HE HF HN	C18 C8 Hilic Rp-Amide Phenyl-Hexyl Peptide ES-C18	2.7 $\mu$ m HALO®
	10 $\mu$ L	4mL/min	1.5 x 5mm	0 3 9 6 9			
	20 $\mu$ L	6mL/min	2.1 x 5mm	0 3 9 7 3	HG HH HI HJ HK HL HM	C18 C8 C4 Hilic Phenyl-Hexyl SAX SCX	3 $\mu$ m EXP®
	40 $\mu$ L	8mL/min	3.0 x 5mm	0 3 9 7 8			
	100 $\mu$ L	10mL/min	4.6 x 5mm	0 3 9 8 3			
					E S	Custom	
				15-	Part Number		

\* Suggested max load rate is based on 60/40 Acetonitrile/Water mobile phase.

U.S. Pat. No.s 5,525,303; 5,730,943; 5,911,954  
and other U.S. and foreign patents pending.

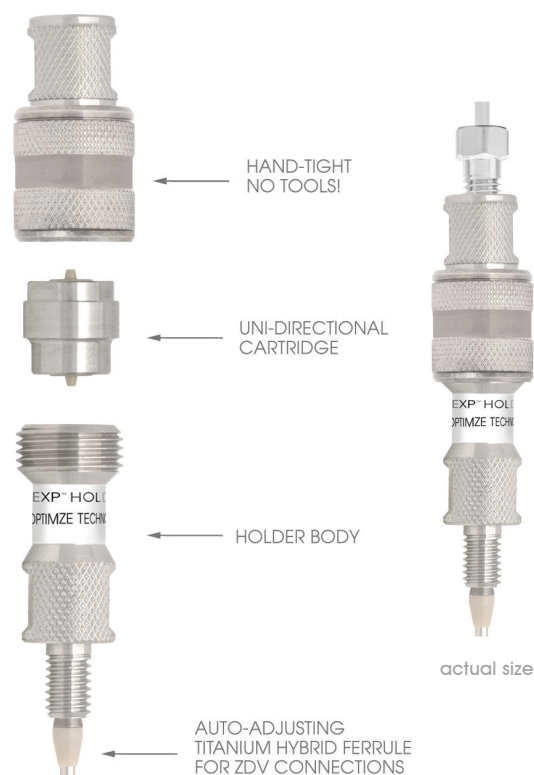
## EXP guard columns

The EXP Guard Column cartridge system is rated to 15,000 psi with hand-tight replaceable cartridges. This unique design connects directly to any UHPLC column with the auto-adjusting Titanium Hybrid Ferrule and EXP<sup>®</sup> Fittings, providing repeated zero-dead-volume connections and easy adjustability between various column types.

Free-turn<sup>®</sup> architecture allows the user to change cartridges by hand without breaking fluid connections on the holder inlet/outlet. The combination of low-dispersion and ultra high-pressure capabilities provides effective protection with negligible effects on retention time, plate count, and peak shape.

### ADVANTAGES OF EXP GUARD COLUMNS

- Hand-tight guard replacement - NO TOOLS!
- Hardware rated to 20,000+ psi (1,400+ bar)
- Packed guard rated for routine use to 15,000 psi (1,000 bar)
- 1.4  $\mu$ L Swept Volume (excluding packed bed)
- Hardened stainless steel end cap eliminates galling
- Low-volume, low-dispersion cartridges
- Auto-adjusting ZDV column connection
- Custom packing available



#### EXP Holder

15-02-03956

EXP Direct Connect Holder  
(Fittings Included)

### EXP GUARD CARTRIDGE SELECTION GUIDE

For bed volume and phase requirements, please refer to the selection guide on the right. Custom packing is also available, please contact us for details.

**Example:** a three pack of 2.1 x 5 mm with C8 Phase (1.8  $\mu$ m) would have part number 15-04104-HB.

Dimension		Dimension Code					Phase Code		Phase	
3 PACKS	1.0 x 5 mm	0	4	1	0	0	H A	C18	1.8 μm	
	1.5 x 5 mm	0	4	1	0	2	H B	C8		
							H C	C4		
							H D	HILIC		
	2.1 x 5 mm	0	4	1	0	4	H E	C18	3 μm	
						H F	C8			
						H G	C4			
						H H	HILIC			
3.0 x 5 mm	0	4	1	0	6	H I	Phenyl-Hexyl			
						H J	SAX			
	4.6 x 5 mm	0	4	1	0	8	H K	SCX		
							E S	Custom		
15-										
Part Number										

U.S. Pat. No.s 5,525,303; 5,730,943; 5,911,954  
and other U.S. and foreign patents pending.



The best way  
to predict the  
**future** is to  
**invent it.**

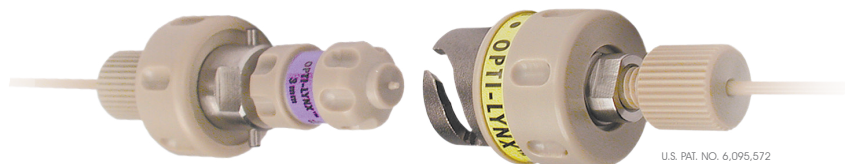
Team with Optimize Technologies to bring your UHPLC concepts to reality – no challenge is too small or too large. We offer state-of-the-art manufacturing and design on-site in Oregon, USA, and our highly experienced engineers, design specialists, chemists, and machinists have exactly what it takes to bring ideas to fruition.

- Need a check valve rated to 30,000+ psi (2,100+ bar)?
- Would a quick-connect UHPLC column improve productivity?
- Interested in upgrading your current HPLC system to perform at UHPLC pressures?

Contact us to discuss ways we can incorporate Optimize Technologies' patented features into your custom applications. Some of the key industries we serve include: Chromatography, Mass Spectrometry, Pharmaceutical Research, Clinical, Environmental, Petrochemical, Defense, and other High Pressure Fluidics. We look forward to helping you optimize your laboratory.



## A revolutionary quick-connect system.



U.S. PAT. NO. 6,095,572

GUARD COLUMN



FILTER OR TRAP



SEALING ELEMENT  
(for straight through union)

When Opti-Lynx was first introduced, it was a revolutionary idea in the HPLC industry—eliminating the use of wrenches for holders, stainless steel fittings, and the cranking down of finger tights to prevent leaks.

“Problems with consistency and column longevity have been virtually eliminated since we started using Opti-Lynx products.”

Partner: PFIZER

Opti-Lynx was the first to fulfill the promise of a low dispersion quick-connect system. From high-throughput labs with the need for replacing components with the utmost efficiency, to single instrument labs that enjoy the ease of use Opti-Lynx offers - many have realized the advantages of the Opti-Lynx quick-connect system.

# Simple. Innovative. Easy to use.

- Quarter-turn connection rated to 6,000 psi
- Low volume/low dispersion interface for volume critical regions
- True zero-dead-volume connection
- Hardware connection is only made once
- NO TOOLS

## Versatility

The Opti-Lynx modular design provides the maximum in versatility for your system. Opti-Lynx inserts can be a filter, guard column, trap cartridge or analytical column. Since the interacting surfaces are identical, the only variable component is the holder tube. Install a guard column for one application and then switch to a pre-column filter for the next. Use an in-line filter with different porosities and diameters just by changing the insert. Switch out columns in an instant with the Velocity<sup>®</sup> system or retrofit current columns with the universal port adapter. We also offer columns with integrated Opti-Lynx end fittings. You can make and break flow paths for multiple detectors, or anywhere else a break in flow is frequently made. Opti-Lynx allows all of this without ever having to change out the basic components.

## Limitless Potential

The potential of Opti-Lynx goes beyond what is listed in this catalog. Opti-Lynx was designed without constraints in mind, and should be viewed as a hardware platform to make your applications easier and more efficient. At Optimize Technologies, we work hard to provide the ideal solution to our customers' applications. If you have a special requirement for your stationary phase, or need Opti-Lynx in a custom dimension or configuration, please contact us.

**Our best ideas come from the needs of our customers.**



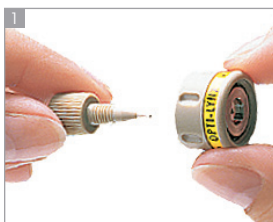
“The Quick-Connect design makes changing columns fast and easy, eliminating the need for any tools.”

Partner: Pfizer

# opti-lynx™

## how it works

With Opti-Lynx, you can make and break tubing connections instantly - all it takes is a quarter-turn, by hand. To make an Opti-Lynx connection, two components - a slotted side and a pinned side - come together around a polymeric insert. One reason why the Opti-Lynx system is so useful and versatile is that the polymeric insert can contain a guard column, a filter, a trap cartridge, or even a whole analytical column. Practically any component found in the HPLC flow path can be made into an Opti-Lynx insert!



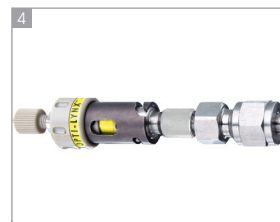
1  
Connect your existing tubing to the Opti-Lynx Holder Cap using the included finger-tight fitting.



2  
Tighten the slotted Holder Tube into the Holder Cap.



3  
Align the Holder Tube and Cap with the Column and Insert.



4  
Bring the pins to the slot guide and twist closed.

# opti-lynx | applications

Opti-Lynx may be used in any number of different applications. Below are just three ways Opti-Lynx quick-connect hardware can be used, but don't let this limit your thinking! We are constantly developing new ways of applying this system through both our applications lab and our customers' imaginations.

## column switching



Set up a simple column-switching rig without the need for expensive high-pressure valves. Install Opti-Lynx universal port adapters on your columns and switch between different columns quickly and easily. When columns are not in use, seal them with the Opti-Lynx quick plug.

## guards to filters & back again



One method requires a filter, while another calls for a guard column - no problem. Simply choose the insert you want, couple it with the correct holder tube, and you're off and running. There is no need to disconnect any tubing, and the only tools you need are your fingers.

## switching flow paths



If you need to reroute flow paths with the utmost efficiency, the Opti-Lynx In-Line Kit is your answer. Simply terminate one tube with a holder cap, and get extra bayonet connectors for each mating tube connection. Switching flow paths becomes a easy task with this setup, not a huge production.

# opti-lynx™

## hardware components

All Opti-Lynx hardware can be purchased in kits or separately as needed for your application. Opti-Lynx hardware is precision machined to maintain the highest quality and strictest tolerances. Below are a few examples of individual Opti-Lynx hardware components, and some complete kits are shown on the facing page to demonstrate how Opti-Lynx works.

### INSERTS



Pre-Column Filter  
(Order Filters on page 25)



Trap Cartridge  
(Order Cartridges on page 26)



Guard Column Cartridge  
(Order Cartridges on page 27)



Velocity™ Column Cartridge  
(Order Cartridges on page 29)

### INDIVIDUAL HOLDER COMPONENTS



11-02333-AA  
Holder Cap  
(With 10-32 Female Port)



11-02212-AA  
Bayonet Connector  
(With 10-32 Female Port)



11-02290-AA  
Universal Port Adapter  
(For all 10-32 Female Ports)



12-02415-AA  
Bayonet Coupler



11-02327-AA  
Holder Tube  
(For Sealing Elements)



11-02570-AA  
Filter & Trap Holder Tube  
(For Filter Inserts & Traps)



11-02328-AA  
Guard Holder Tube  
(For 15 mm Guard Column Cartridges)

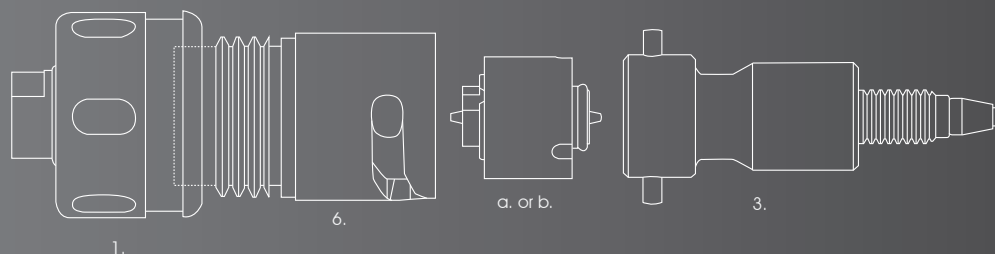


12-02617-AA  
Holder Tube  
(For 30 mm Velocity™ Cartridges)

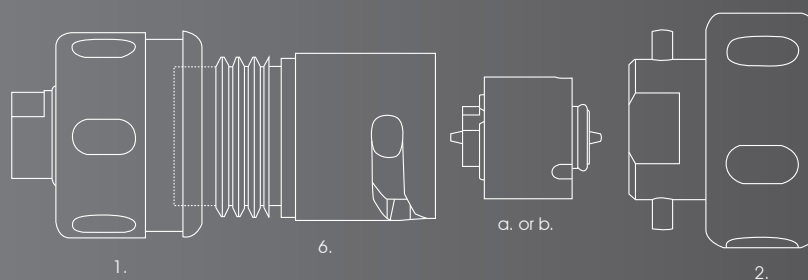
# configurations

There are many ways to use Opti-Lynx, and there are many options for Opti-Lynx inserts. If you have special requirements for your stationary phase or would like Opti-Lynx hardware in custom dimensions or configurations, please contact us. Here are a few examples of how Opti-Lynx can be used:

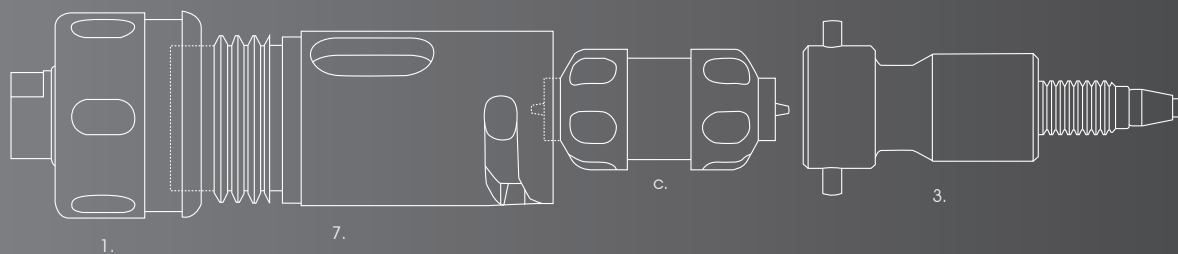
## pre-column filter / direct-connect trap example



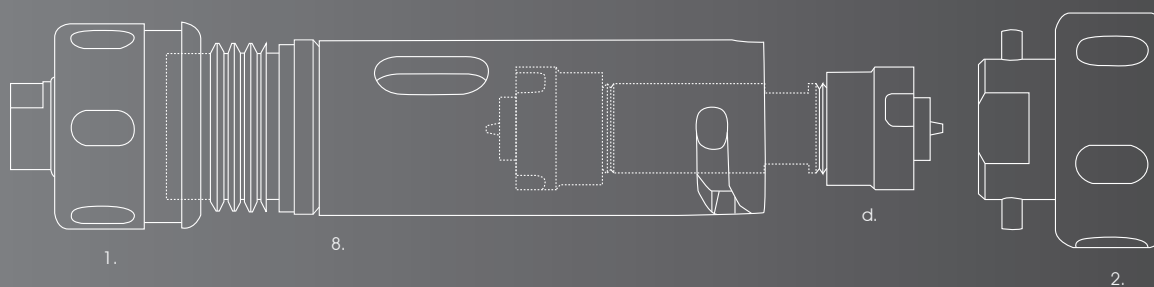
## in-line filter / trap column example



## guard column example



## analytical column example



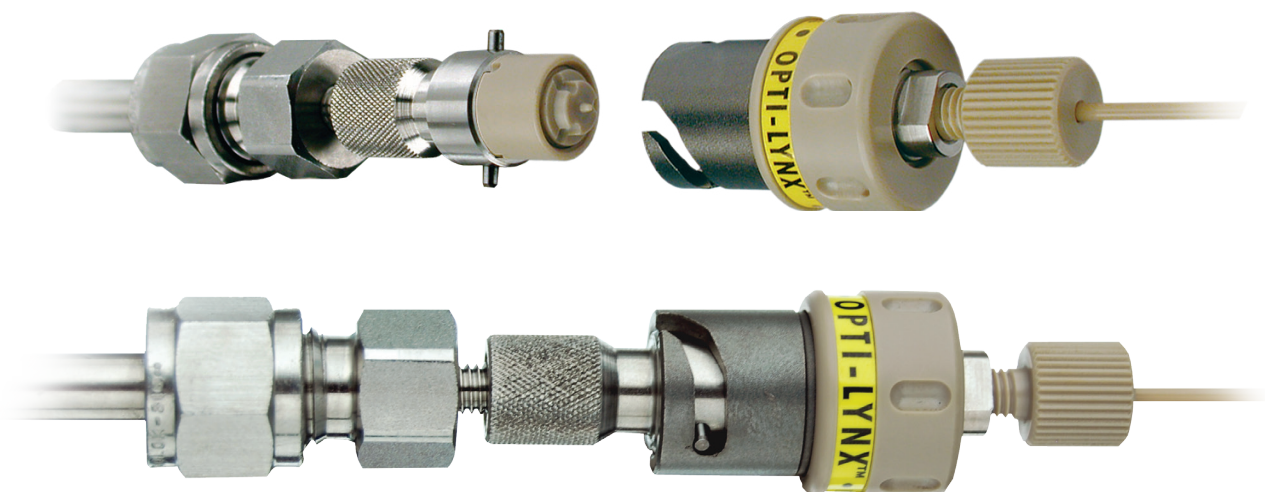
# opti-lynx™ filtration

Need more room to change your in-line or pre-column filter? With HPLC systems getting smaller and more compact, the areas to work with are also decreasing in size. This often makes getting to the components that need frequent changing quite a task - especially if you need wrenches.

The Opti-Lynx In-Line Filter System features Optimize Technologies' proprietary Opti-Lynx hardware, allowing filter changes to be done in a quick quarter-turn. Opti-Lynx In-Line Filters offer unmatched versatility with a choice of nine different porosity/diameter combinations for every possible filtration need. Our revolutionary quick-connect design is ideal for high temperature GPC and position-emitting radionuclide filtration - not just HPLC.



U.S. PATENT NO. 5,525,303



To change an **opti-lynx™** pre-column filter, simply twist the holder - **no tools required.**

Pre-Column Filters can help extend the life of your analytical column by catching particulates that would otherwise clog the column inlet frit. The Opti-Lynx Pre-Column Filter System brings unparalleled versatility to pre-column protection, with the added convenience of quick-connect operation.



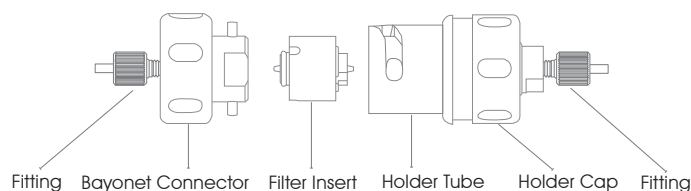
Each **opti-lynx™** filter insert shares the same external dimensions, allowing you to use different diameters and porosities with the same holder hardware.

### OPTI-LYNX FILTER INSERT SELECTION GUIDE

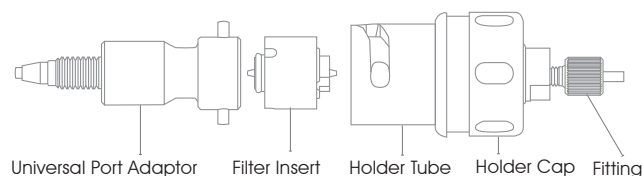
		Single	10 Pack	
Recommended for Pre-Column use		11-02595-CD	11-02797-CD	Low Volume Filter Insert, 0.5 µm/0.062" diameter
		11-02595-CE	11-02797-CE	Low Volume Filter Insert, 2.0 µm/0.062" diameter
		11-02595-CF	11-02797-CF	Medium Capacity Filter Insert, 0.5 µm/0.125" diameter
		11-02595-CG	11-02797-CG	Medium Capacity Filter Insert, 2.0 µm/0.125" diameter
Recommended for In-Line use		11-02595-CH	11-02797-CH	High Capacity Filter Insert, 0.5 µm/0.187" diameter
		11-02595-CI	11-02797-CI	High Capacity Filter Insert, 2.0 µm/0.187" diameter
		11-02595-CJ	11-02797-CJ	Semi-Prep Filter Insert, 2.0 µm/0.250" diameter*
		11-02595-CL	11-02797-CL	Semi-Prep Filter Insert, 10.0 µm/0.250" diameter*
		Single	5 Pack	
Prep		11-03038-C4	11-03039-C4	Prep Filter Insert, 10.0 µm/0.250" diameter (For use with OPTI-LYNX Prep Holder only)

\*Opti-Lynx Semi-Prep Filter Inserts are rated for use at pressures of up to 4,000 psi (other Opti-Lynx products are rated to 6,000 psi unless otherwise stated). Opti-Lynx Filter Inserts are rated at temperatures up to 175° C.

#### In-Line Filter / Prep Filter Holder



#### Pre-Column Filter



#### OPTI-LYNX Filter Holders

11-02225-AA	OPTI-LYNX In-Line Filter Holder Includes: Bayonet Connector, Holder Cap, Holder Tube, Fittings
11-03200-AA	OPTI-LYNX In-Line Prep Filter Holder - For use with Prep Inserts only Includes: Bayonet Connector, Holder Cap, Holder Tube, Fittings
11-02226-AA	OPTI-LYNX Pre-Column Filter Holder Includes: Universal Port Adaptor, Holder Cap, Holder Tube, Fitting

OPTI-LYNX filter inserts are ordered separately. Please use the table above to find your part number.

# opti-lynx™ trap columns

Opti-Lynx trap columns combine the convenience of our quick-connect holder with a versatile selection of packed-bed cartridges to offer chromatographers numerous options for on-line or off-line sample cleanup and preconcentration. Each cartridge shares the same external dimensions, allowing you to use different diameters and porosities with the same holder hardware.

Opti-Lynx traps are available in packed-bed volumes of 4  $\mu$ L to 100  $\mu$ L with a wide range of standard and custom packings. Whether you want to separate a peptide digest from its matrix for further analyses, or prepare a dilute small molecule sample for LC injection without any sample loss – Opti-Lynx Traps are the ideal tool to optimize your technique. These columns can be loaded and regenerated repeatedly for maximum value. For smaller volume packed-bed trapping columns, please see Opti-Pak on pg. 36. For more information on Trapping Applications, please visit [www.optimizech.com/literature](http://www.optimizech.com/literature).



OPTI-LYNX In-line Trap Holder

## selecting your opti-lynx™ trap

Use the selection guide below to find the five digits that match the trap dimensions you require. Then find the two letter packing code for your phase. **Example:** a five-pack of 20  $\mu$ L trap cartridges with SCX phase would have part number 11-02870-TB.

### OPTI-LYNX TRAP SELECTION GUIDE

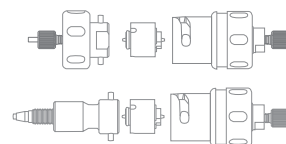
	Capacity	Load Rate	Bed Volume	Dimension	Dimension Code	Phase Code	Phase
5 PACKS	16 $\mu$ g	40 - 160 $\mu$ L/min	4 $\mu$ L	1 x 5 mm	0 2 8 6 8	T A	C18
	40 $\mu$ g	100 - 500 $\mu$ L/min	10 $\mu$ L	1.5 x 5 mm	0 3 7 8 7	T B	SCX
	80 $\mu$ g	200 - 800 $\mu$ L/min	20 $\mu$ L	2.1 x 5 mm	0 2 8 7 0	T D	C18AQ
	160 $\mu$ g	0.4 - 1.6 mL/min	40 $\mu$ L	3.0 x 5 mm	0 2 8 7 2	T E	SAX
	400 $\mu$ g	1 - 4 mL/min	100 $\mu$ L	4.6 x 5 mm	0 2 8 7 4	T F	C8
						T G	C4
						T H	DVB
						D Q	DVB/SCX
						E S	Custom

11-						-		
Part Number								

### OPTI-LYNX Trap Holders

11-02225-AA	OPTI-LYNX In-Line Trap Holder Includes: Bayonet Connector, Holder Cap, Holder Tube, Fittings
11-02226-AA	OPTI-LYNX Direct-Connect Trap Holder Includes: Universal Port Adapter, Holder Cap, Holder Tube, Fitting



OPTI-LYNX trap cartridges are ordered separately. Please use the table above to find your part number.

Contact us for Biocompatible Holder and Cartridge options.

# opti-lynx™ guard columns

The Opti-Lynx Guard Column is a high performance, cartridge-based guard system, suitable for use with any analytical column. Some cartridge-based guard column products offer convenience with a price: higher internal volumes. At Optimize Technologies, we refuse to compromise performance for anything. Opti-Lynx utilizes low dispersion component interfaces to keep extra column volume to a minimum: connection paths have a total internal volume of less than 2  $\mu\text{L}$ . You get quick-connect convenience and low dispersion, all in one package.

The Opti-Lynx Guard Column fits any analytical column with a 10-32 port. Start with our Opti-Lynx Guard Column Holder Kit, then select Opti-Lynx Guard Cartridges in the chemistries you require. They are available individually and in packs of five.



## selecting your opti-lynx™ guard column cartridges

Use the selection guide below to find the five digits that match the dimension and quantity you require. Then, find the two letter packing code for your sorbent/phase. Complete your guard column cartridge part number by using these codes in the part number template below the table.

**Example:** a five-pack of 3 mm C18 guard cartridges would have part number 11-02630-EA.

OPTI-LYNX GUARD SELECTION GUIDE

	Quantity	Dimension Code	Phase Code	Phase
3.0 x 15 mm	Singles	0 2 2 5 5	E A	C18, 5 $\mu\text{m}$
	5 Pack	0 2 6 3 0	E B	C8, 5 $\mu\text{m}$
2.1 x 15 mm	Singles	0 2 6 4 0	E C	Silica, 5 $\mu\text{m}$
	5 Pack	0 3 7 8 2	E D	Phenyl, 5 $\mu\text{m}$
1.0 x 15 mm	Singles	0 2 3 0 8	E E	Cyano/CN, 5 $\mu\text{m}$
	5 Pack	0 3 1 2 8	E F	Amino/NH2
			E G	Anion/SAX
			E H	Cation/SCX
			J D	DVB/SCX

11- 

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Part Number

### OPTI-LYNX Guard Column Direct-Connect Holder

**11-02232-AA** Holder for direct connection to analytical columns  
Includes: Universal Port Adapter, Guard Holder Tube, Holder Cap, Fitting

OPTI-LYNX guard cartridges are ordered separately. Please use the table above to find your part number.



U.S. PATENT NO.  
5,525,303

opti-lynx™ guard columns



# velocity<sup>®</sup>

## analytical columns



Liquid chromatography is no longer limited to the "one column, one assay" setup. Researchers are now being asked to screen thousands upon thousands of compounds, all in less time. This is why Optimize Technologies offers Velocity - a true quick-connect analytical column system.

Velocity incorporates the Opti-Lynx™ system to provide connections in a quarter-turn. Rated to 6,000 psi, Velocity columns are individually quality tested and certified to guarantee analytical performance. Opti-Lynx quick-connect technology allows columns to be changed effortlessly: scale down column dimensions, switch between stationary phases, or swap methods in seconds - all without the use of tools.



Need to use a pre-column filter or guard column? With Velocity's integral pre-column protection hardware, adding or changing guard columns and filters is as easy as changing Velocity columns - just grab and twist.

Most importantly, Velocity and Opti-Lynx hardware will not adversely affect your chromatographic applications. Velocity is not affected by the shortcomings of other cartridge column designs such as excessive dead volumes and substandard performance versus conventional designs. Velocity has been meticulously engineered to the most stringent of standards. All connections conduct liquid through low-volume interfaces minimizing hardware contributions to dispersion and peak broadening.



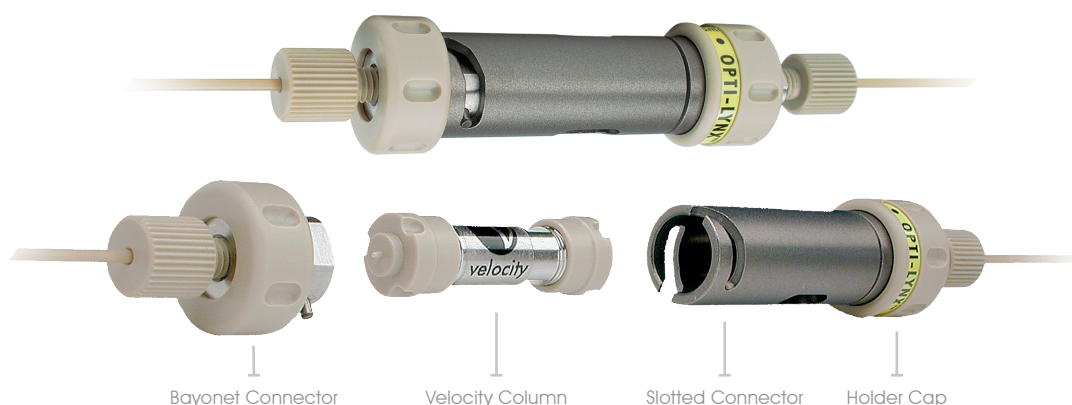
# velocity<sup>®</sup>

## At the speed of discovery.

## how does **velocity**® work?

Velocity is based on the Opti-Lynx™ system, so it uses the same four basic components: bayonet connector, insert, slotted connector, and holder cap. All columns of the same length share the same external dimensions, so switching between different IDs and packings requires no change in hardware configuration. To see a demonstration, go to [www.optimizech.com/velocityhplc](http://www.optimizech.com/velocityhplc).

A simple quarter-turn engages the **opti-lynx**™ connection.



**Velocity**® is an improvement over conventional designs plagued with excessive dead volume or cumbersome hardware.

Need to change column lengths? No problem. Just unscrew and install the appropriate slotted connector tube - no need to re-plumb any solvent lines. Once you are ready to go, a simple quarter-turn engages the Opti-Lynx connection. The actuation torque is so small, it's easier than opening a pickle jar.

### PHASES & CHEMISTRIES

Velocity cartridge columns are available in multiple flavors, each available in 3  $\mu\text{m}$  and 5  $\mu\text{m}$  particle sizes. We also offer a selection of custom phases.

For more information or to order Velocity, contact an Optimize representative or visit our website at [www.optimizech.com](http://www.optimizech.com).

# opti-solv® filtration

Keeping particulates out of the flow path prevents premature wear on vital components, drastically reducing the need for costly replacements or repairs. A holistic approach to filtration addresses potential particulates throughout the solvent flow path and leads to consistent and efficient chromatography. Generally, there are three critical areas where filtration is necessary.

## solvent reservoir

While the availability of HPLC-grade solvents diminishes the need for pre-filtering, it is still imperative that a filtration device be installed in the reservoir. Placing a filter in the reservoir is an economical way to filter particles that may result from buffer salt precipitation, airborne dust, improperly cleaned glassware, or microbial contamination; none of which are remedied by the use of HPLC-grade solvents.

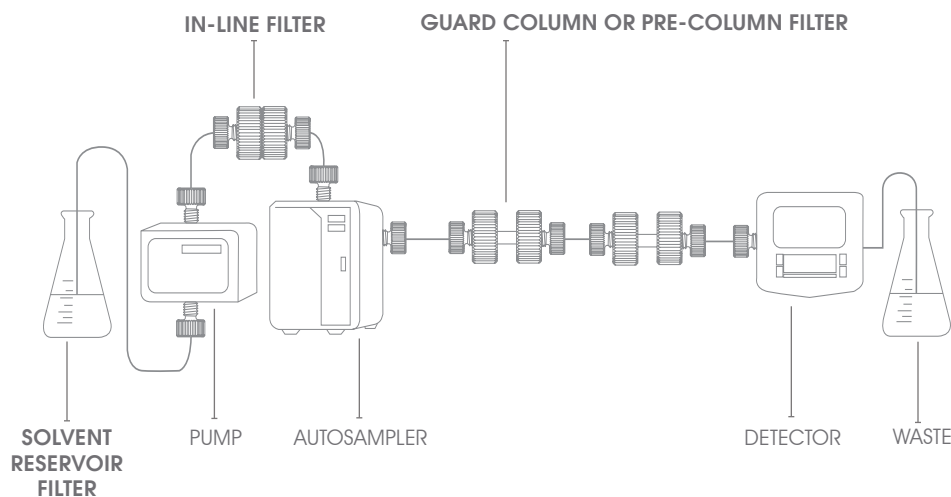
## in-line

The frictional forces generated at the piston/seal interface inevitably lead to particulate shedding. Placement of a filtering element between the pump and injector/autosampler removes these particulates, preventing problems with downstream components and costly downtime.

## pre-column | direct connect

Many things contribute to particulates in the post-injector region: incompatibilities between sample matrix and mobile phase, septa coring from the sample needle and shedding from moving parts in the injector, among others. Use of a low-impact, pre-column filter removes these particulates from the flow path, saving your analytical column and detector from deleterious effects.

## filtration process





# solvent reservoir filter

Opti-Solv Reservoir Filters employ a unique conical design inside the filter housing to prevent air bubbles from getting trapped and disturbing your analysis.

A solid PTFE body keeps Opti-Solv in the bottom of the bottle where a bottom-mounted titanium frit provides unrestricted solvent access. As always, Optimize makes installation as simple as possible - no tools or fittings required.



## Biocompatible Opti-Solv Analytical Reservoir Filters

		Singles	5 Packs
1/16" OD Tubing	2 $\mu\text{m}$	10-04-00079	10-04-00080
	10 $\mu\text{m}$	10-04-00081	10-04-00082
1/8" OD Tubing	2 $\mu\text{m}$	10-04-00047	10-04-00050
	10 $\mu\text{m}$	10-04-00051	10-04-00053
3/16" OD Tubing (Waters Style)	2 $\mu\text{m}$	10-04-00054	10-04-00056
	10 $\mu\text{m}$	10-04-00057	10-04-00058



## Biocompatible Opti-Solv Analytical Reservoir Prep Filters

1/8" OD Tubing	10 $\mu\text{m}$	10-04-00063	10-04-00065
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All of the above filters are supplied with 5 feet of PTFE tubing pre-installed

## Reservoir Filters with Tube Stem

Reservoir Filters with tube stems are made with Hastelloy C® for maximum corrosion resistance and inertness.

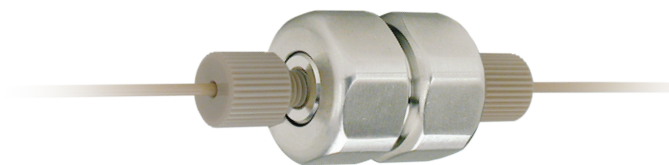
		Singles	5 Packs
1/16" ID Tubing	2 $\mu\text{m}$	10-04-00071	10-04-00072
	10 $\mu\text{m}$	10-04-00073	10-04-00074
1/8" ID Tubing (Waters Style)	2 $\mu\text{m}$	10-04-00115	10-04-00119
	10 $\mu\text{m}$	10-04-00111	10-04-00114



## in-line filter

Installed between the pump and injector/autosampler, the in-line filter prevents damage to downstream components – damage that can cost you in both instrument downtime and troubleshooting labor.

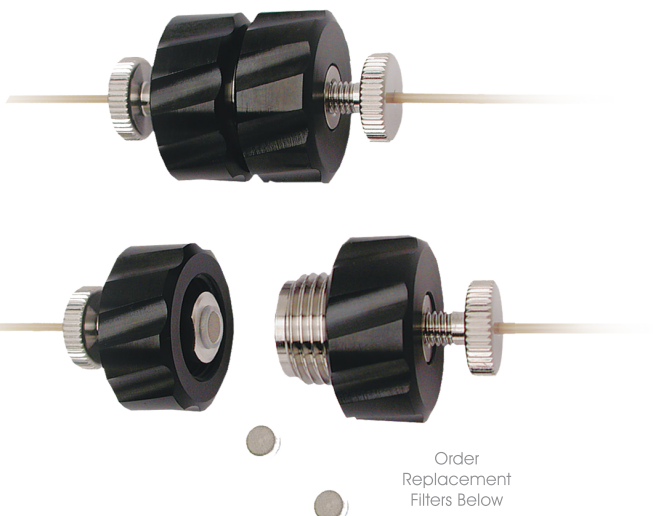
Stainless Steel Wrench-Tight Version



“ We have been using **Opti-Solv<sup>®</sup> In-Line Filters** for several years in our high-throughput LC/MS Analysis of ADME screening samples. ”

**Partner: Pfizer ADME Technology Group**

PEEK "Gorilla Grip" Hand-Tight Version



Hand tighten the PEEK holder to make a high-pressure seal, or for those who prefer wrenches, we also offer a wrench-tight stainless steel version. The user-friendly designs are well suited for a number of applications, such as high temperature environments where quick changes are imperative.

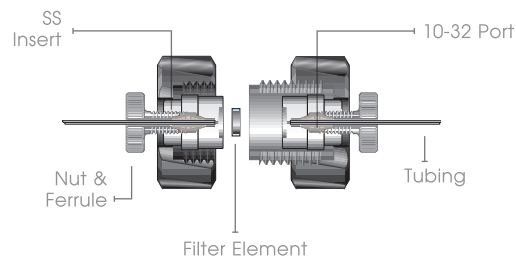
### OPTI-SOLV In-Line Solvent Filter Holders

- 10-04-03685 In-Line Solvent PEEK Hand-Tight Holder
- 10-04-03686 In-Line Solvent Stainless Steel Wrench-Tight Holder

### OPTI-SOLV Filter Elements (Frits)

- 10-04-03699 0.5  $\mu\text{m}$ , 0.062" Dia. Filter, 10/Pk
- 10-04-03700 2  $\mu\text{m}$ , 0.062" Dia. Filter, 10/Pk
- 10-04-03701 0.5  $\mu\text{m}$ , 0.125" Dia. Filter, 10/Pk
- 10-04-03702 2  $\mu\text{m}$ , 0.125" Dia. Filter, 10/Pk
- 10-04-02370 0.2  $\mu\text{m}$ , 0.187" Dia. Filter, 10/Pk
- 10-04-00100 0.5  $\mu\text{m}$ , 0.187" Dia. Filter, 10/Pk
- 10-04-00103 2  $\mu\text{m}$ , 0.187" Dia. Filter, 10/Pk

Two-Piece PEEK or Stainless Steel Holders



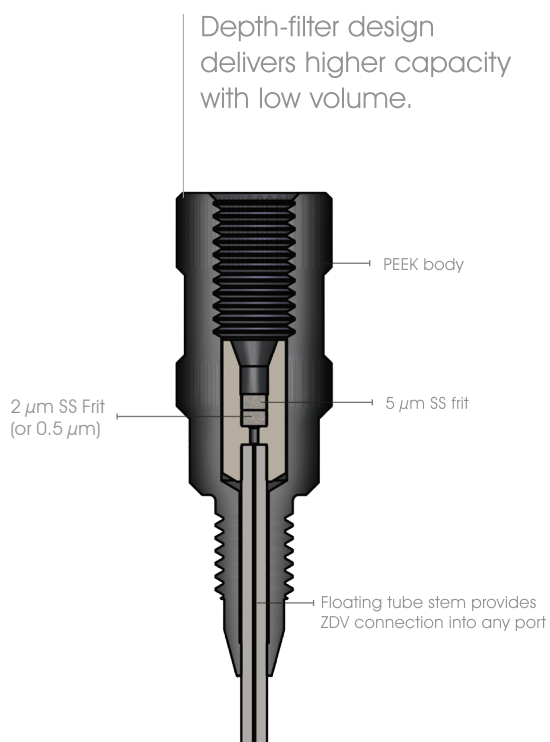
The Opti-Solv's unique swivel design allows frits to be changed without removing the connecting tubing. Just plumb it once and leave it.

# opti-solv<sup>®</sup> mini filter

The Opti-Solv Mini Filter provides low-impact filtration in a package no larger than a finger tight fitting. Use them to extend the life of your analytical column, or before your mass spectrometer as a last line of defense against debris.

Perfect zero-dead-volume connections are obtained every time with our patented automatic tube stop depth adjustment. Unique depth-filtering elements allow for greater capacity with no band spreading or loss of performance. The efficient design requires no holder, and threads directly into any 10-32 port.

The **opti-solv<sup>®</sup>** mini filter automatically adjusts to fit all brands of columns.



## OPTI-SOLV Mini Filters

10-04-00095	OPTI-SOLV Mini Filter, 0.5 $\mu\text{m}$ , 5/Pk
10-04-00097	OPTI-SOLV Mini Filter, 2.0 $\mu\text{m}$ , 5/Pk
10-04-02768	OPTI-SOLV Mini Filter, 5.0 $\mu\text{m}$ , 5/Pk

# opti-solv® micro filter

For your volume critical filtering needs, we now offer the Opti-Solv Micro Filter. Based on the same design that has made the Mini Filter a huge success, the Micro Filter cuts the internal volume to less than 200 nL but retains the ease of use and functionality of the Mini Filter.



The Micro Filter is designed to be used in today's low volume, high sensitivity chromatographic applications as a last line of defense against debris. As with all Optimize column protection products, the Opti-Solv Micro Filter features a zero-dead-volume connection utilizing our patented floating stem (auto-adjusting) technology.

The **optisolv®** micro filter is easy to use and performs exceptionally well for volume-critical applications.

## Advantages of the **optisolv®** mini, micro and nano filters:

- Designed to filter out particles extending column life
- Perfect Zero-Dead-Volume connections every time
- Floating stem automatically adjusts to any depth port
- Easy to use finger tight - No tools required
- Rated to 6,000 psi

### OPTI-SOLV Micro Filters

10-04-03707	OPTI-SOLV Micro Filter, 10 µm, 5/Pk
10-04-03357	OPTI-SOLV Micro Filter, 1.0 µm, 5/Pk
10-04-03389	OPTI-SOLV Micro Filter, 2.0 µm, 5/Pk
10-04-03621	OPTI-SOLV Micro Filter, 0.5 µm, 5/Pk

### OPTI-SOLV Biocompatible Micro Filters

10-04-03936	OPTI-SOLV Biocompatible Micro Filter, 0.5 µm, 5/Pk
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U.S. PATENT  
NO. 5,525,303

# opti-solv<sup>®</sup> nano filter

The Opti-Solv Nano Filter follows our Micro Filter but cuts the internal volume down even further.

With less than 50 nL of internal volume, the Opti-Solv Nano Filter is ideal for mass spectrometry to protect your electrospray and nanospray tips from clogging with debris.



## OPTI-SOLV Nano Filters

10-04-03625 OPTI-SOLV Nano Filter, 0.5  $\mu\text{m}$ , 5/Pk

## OPTI-SOLV Biocompatible Nano Filters

10-04-03939 OPTI-SOLV Biocompatible Nano Filter, 0.5  $\mu\text{m}$ , 5/Pk

# opti-pak<sup>®</sup> trap columns

The Opti-Pak is specially designed for use in today's low volume applications. With bed volumes ranging from 0.12  $\mu\text{L}$  to 5.0  $\mu\text{L}$ , you can find the perfect balance between sample capacity and trap volume. A proprietary method of frit placement allows the packed stem to be positioned directly into the flow path, which eliminates all excess swept volume. Less swept volume translates to absolute minimum sample dilution and dispersion.

The unique hardware design integrates a PEEK holder with an auto-adjusting stem which provides a fluid interface with any 10-32 standard or microinjector port, and guarantees a zero-dead-volume connection despite variances in tubestop depth.

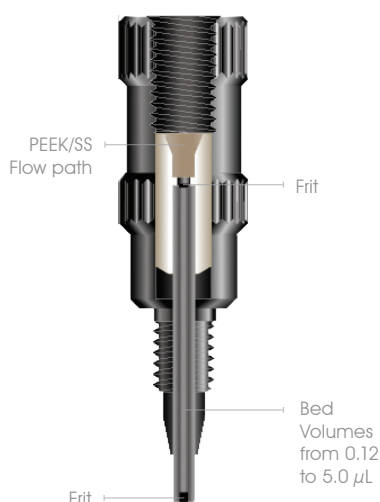
For larger volume packed-bed trapping columns, please see Opti-Lynx on pg. 26.



U.S. PATENT  
NO. 5,625,303

**opti-pak** trap columns with bed volumes as low as 0.12  $\mu\text{L}$  can be installed into any 10-32 injection port. The stem auto-adjusts to provide a flawless ZDV connection every time.

## Floating Stem Design For ZDV Connection into Any Port



Installing an Opti-Pak into the outlet of a switching valve will facilitate the trapping, desalting, and pre-concentration of an analyte mixture. With Opti-Pak's versatility, a second trap can be added downstream in the loop of an injection valve and effectively perform a 2D separation.

The elegant, flexible design of Opti-Pak makes it amenable to virtually any trapping application. Opti-Pak can be installed directly into the fitting port of an injection valve. Two or more Opti-Paks can also be installed side by side in the same valve stator without interference.

For more information on Trapping Applications, please visit [www.optimizech.com/literature](http://www.optimizech.com/literature).

## selecting your **opti-pak** trap

Use the trap cartridge selection guide below to find the five digits that match the bed volume you require. Then find the two letter packing code for the phase. Complete the trap cartridge part number by using these codes in the part number template located below the selection guide.

**Example:** a five pack of 0.5  $\mu\text{L}$  trap cartridges with SCX phase would have part number 10-03317-TE.

Opti-Pak is available in a number of sorbents and chemistries to fit any application. Custom packing is also available - please contact us if you do not see the materials you require.

### Opti-Pak Trap Columns for standard 10-32 injection valves (Includes 5 disposable holders and cartridges)

	Capacity	Load Rate	Bed Volume	Dimension Code					Phase Code	Phase
STANDARD 10-32	0.5 $\mu\text{g}$	1.25 - 5 $\mu\text{L}/\text{min}$	0.12 $\mu\text{L}$	0	3	3	2	8	T A	C18
	1 $\mu\text{g}$	2.5 - 10 $\mu\text{L}/\text{min}$	0.25 $\mu\text{L}$	0	3	3	2	4	T B	C18AQ
	2 $\mu\text{g}$	5.0 - 20 $\mu\text{L}/\text{min}$	0.5 $\mu\text{L}$	0	3	3	1	7	T C	C8
	4 $\mu\text{g}$	10 - 40 $\mu\text{L}/\text{min}$	1 $\mu\text{L}$	0	3	2	2	5	T D	C4
	8 $\mu\text{g}$	20 - 80 $\mu\text{L}/\text{min}$	2 $\mu\text{L}$	0	3	2	2	9	T E	SCX
	20 $\mu\text{g}$	50 - 200 $\mu\text{L}/\text{min}$	5 $\mu\text{L}$	0	3	2	3	3	T F	SAX
BIO-COMPATIBLE 10-32	12 $\mu\text{g}$	30 - 120 $\mu\text{L}/\text{min}$	3 $\mu\text{L}$	0	3	6	0	8	T G	DVB
RHEODYNE M4 STYLE	0.7 $\mu\text{g}$	1.75 - 7 $\mu\text{L}/\text{min}$	0.17 $\mu\text{L}$	0	3	7	1	8	E S	Custom
	2 $\mu\text{g}$	5.0 - 20 $\mu\text{L}/\text{min}$	0.5 $\mu\text{L}$	0	3	7	2	0		
VALCO 6-40	0.7 $\mu\text{g}$	1.75 - 7 $\mu\text{L}/\text{min}$	0.17 $\mu\text{L}$	0	3	7	2	4		
	2 $\mu\text{g}$	5.0 - 20 $\mu\text{L}/\text{min}$	0.5 $\mu\text{L}$	0	3	7	2	6		



10-32



Biocompatible



M4



6-40

10-      -

Part Number

### OPTI-PAK Method Development Kit

10-02-04134

Each kit includes 5 assorted cartridges of choice



# opti-guard<sup>®</sup> guard columns

The column is the heart of any liquid chromatography system and remains the most problematic component. HPLC columns accumulate retained material which can dramatically reduce longevity and cause costly downtime costs resulting from premature column failure and troubleshooting efforts.

## why use a guard column?

The best way to protect an analytical column from fouling is to install a guard column between the injection valve and the analytical column. The guard column traps particulates, solvent impurities, and retained sample components. The ideal guard column should have no effect on the separation. In order to achieve this, a guard column with matching bonded phase and optimal hardware configuration should be selected.

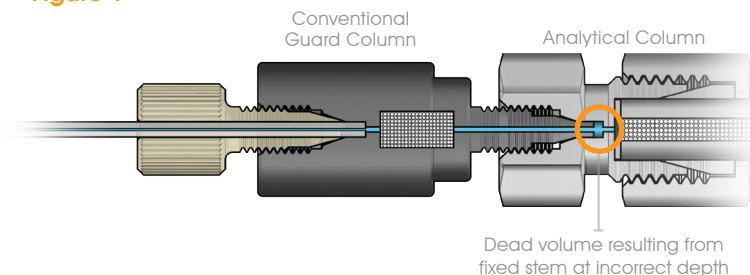


U.S. PATENT NO.  
5,525,303

## extra column volume

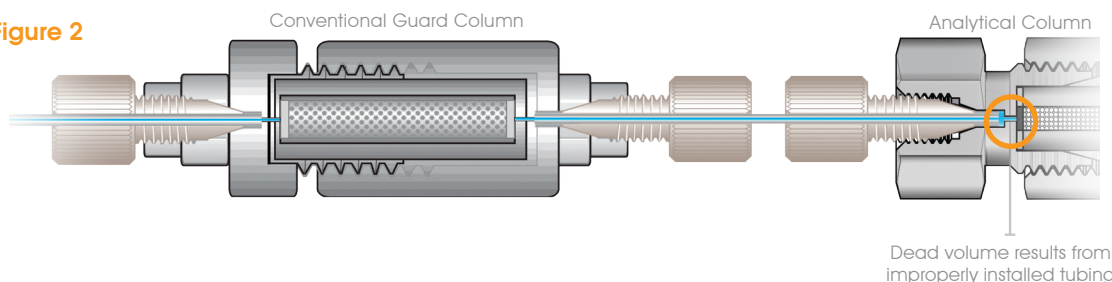
The ever-changing needs of HPLC applications such as smaller bed-volume columns, higher pressures, and increased sensitivity raise new demands on guard columns today. Many guard column manufacturers overlook the dead volume that results when a guard column or holder is connected to the analytical column. The use of pre-swaged or one piece nut and ferrule designs with fixed tube stems will increase extra column volume (shown in blue) and affect column efficiency (Figure 1).

Figure 1

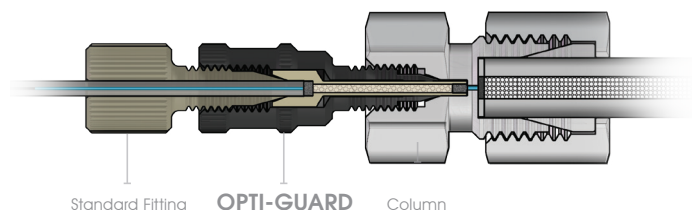


In addition, other cartridge-style guard column systems require extra connections and tubing, adding to extra column volume and decreasing your system's overall performance. (Figure 2)

Figure 2



Floating tube stem provides ZDV connection into any port.



# opti-guard<sup>®</sup> 3mm

Opti-Guard sets the standard for low impact, easy to use pre-column protection. Designed for use with analytical (4.6, 3.0 mm i.d.) and narrow-bore (2.1, 1.0 mm i.d.) columns, the patented floating stem design automatically adjusts to any manufacturer's tube stop depth for a zero-dead-volume connection every time. The best part? It's no larger than a standard fitting.

Connecting the Opti-Guard requires no extra tubing or tools, maintaining the minimal impact philosophy that has made the Opti-Guard line so popular. As always, custom packing is available.

# opti-guard<sup>®</sup> 1mm

The Opti-Guard 3 mm maintains the tool-free connectivity of the 1 mm, but incorporates a cartridge-based format to allow for a larger bed with more capacity. The two-part holder is designed for use with any analytical column to provide vital protection from dirty samples and strongly retained contaminants. An auto-adjusting stem conforms to any tube stop depth for a perfect zero-dead-volume connection.

## OPTI-GUARD 1mm Guard Column

10-02-00007	C18, 5/Pk
10-02-00010	C8, 5/Pk
10-02-03211	C4, 5/Pk
10-02-00014	Silica, 5/Pk
10-02-00018	Phenyl, 5/Pk
10-02-00022	Cyano/CN, 5/Pk
10-02-00026	Amino/NH <sub>2</sub> , 5/Pk
10-02-00030	Anion Exchange, 5/Pk
10-02-00034	Cation Exchange, 5/Pk
10-02-01714	Method Development Kit (Assorted 5/Pk)
10-02-03463	Custom Packed, 5/Pk

## OPTI-GUARD 1mm Biocompatible Guard Column

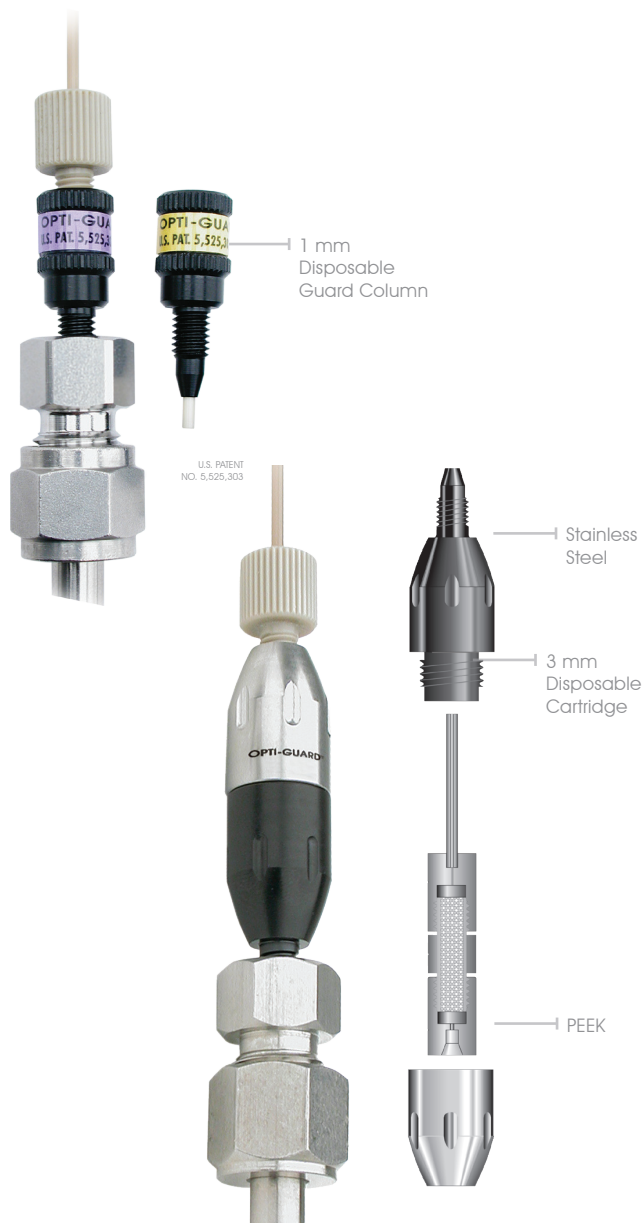
10-02-03532	Biocompatible C18, 5/Pk
10-02-03680	Biocompatible Anion Exchange, 5/Pk
10-02-03683	Biocompatible Cation Exchange, 5/Pk
10-02-03534	Biocompatible Silica, 5/Pk

## OPTI-GUARD 3mm Guard Column Cartridges

10-02-01482	C18 Guard Column Cartridge, 5 $\mu$ m, 3/Pk
10-02-01485	C8 Guard Column Cartridge, 5 $\mu$ m, 3/Pk
10-02-01494	C4 Guard Column Cartridge, 5 $\mu$ m, 3/Pk
10-02-01491	Silica Guard Column Cartridge, 5 $\mu$ m, 3/Pk
10-02-01488	Amino/NH <sub>2</sub> Guard Column Cartridge, 5 $\mu$ m, 3/Pk
10-02-03050	Cyano/CN Guard Column Cartridge, 5 $\mu$ m, 3/Pk

## OPTI-GUARD 3mm Guard Column Holder

10-02-01495	OPTI-GUARD 3 mm PEEK/Stainless Steel Holder
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## hplc & uhplc oem systems

In the following pages you will find a list of replacement components designed specifically for OEM HPLC/UHPLC solvent delivery systems. At Optimize Technologies, we precision machine our components to the most exacting standards in the industry. Everything in the manufacturing process is controlled to ensure the continuing quality that has long been associated with the Optimize name. From the individual matching of check valve ball and seat sets to the proprietary blend of materials in our seals - experience the Optimize advantage.

Every replacement component we offer is designed to meet or exceed original equipment specifications.

**Guaranteed.**



### optimize and oem components



Most instrument manufacturers will tell you quite emphatically that for optimal instrument performance, you should only use components that match their performance specifications. We could not agree more. Every replacement component we offer is designed to meet or exceed original equipment specifications - guaranteed. In fact, several major OEM manufacturers incorporate Optimize components as original equipment on their new HPLC and UHPLC instruments. They realize the positive impact Optimize quality can have on instrument performance.

### optimize innovation



Innovation is our driving force. Although we offer a comprehensive selection of components for most brands of HPLC systems, we are always in the process of R&D to discover new products that will save your laboratory time and money. If you have a need for a product you do not see in this catalog, please call a technical support representative to discuss your particular fluid handling needs.

## HPLC Finder™

	BRAND	MODELS	PAGE NO.
<b>A</b>	ABI	Spectraflow 400	50
	Agilent	1050, 1090, 1100, 1200	51-53
	Alcott	Micromeritics 760, 765	56
	Anspec	SM 909	56
<b>B</b>	BAS	PM-48	64
	Beckman/Altex	100A, 105, 110A/B, 110 Prep, 112/112M, 114/114M, 116, 118, 125, 126, 127, 128	54
	Bio-Rad	1330, 1350, 1350T, 2700, 2800	55
	Bischoff	2200, 2250	56
<b>D - G</b>	Dionex	DQP, GPM-1&2, DRP, DXP, AGP, 2000, 4000, GP-40, IP-20, GP-50, IP-25	57
	Dupont	8800	64
	ESA	Model 580, 582, 584, 5700 SDM	62-64
	Gilson	All Pumps with 5, 10 or 25 mL S/SC Heads	67-68
	Gynkotec	300, M480	50
<b>H - J</b>	Hewlett Packard	See Agilent	51-53
	Hitachi	655, L-6000, L-6200/6200A, L-7100/LaChrom, L-2100, Smash Pump, L-2130, 7200, 7250	58
	Jasco	BIP-1, 880/980 Series, PU-2080, 2085, 2089, 1580-C02, 980, 1586, 2086, 986	59
<b>K - P</b>	Kratos	Spectraflow 400	50
	LDC/Milton Roy	All Analytical Pumps (including Constametric, Minimetric, Minipump)	65
	LKB/Amersham/Pharmacia	2150, 2248, 2250	60
	Perkin-Elmer	Series 1, 2, 3, 3B, 4, 10, 100, Model 250, 200, 400, 410, 620, Integral 4000	61
<b>R - S</b>	Rainin	HP, HPX, HPXL, SD 200/300, Prostar 210/215	67-68
	Shimadzu	LC-6A, LC-7A, LC-8A, LC-9A, LC-10AT, LC-10ATVP, LC-10AD, LC-10ADVP, LC-10AS, LC-600 LC-AD/LC-20 AB, LC-20 AT, LC-2010, GP-20 & 50, LC-20 ADXR, SIL-10ADUP, GEP	62-63
	Spectra-Physics	8700, 8800, 8810, IsoChrom, P-Series, 8700XR, 8750	66
	SSI	200 Series, Model 300	64
	Sysmex	CA1000, CA500	50
<b>T - W</b>	Thermo	See LDC/Milton Roy, Spectra-Physics for model listings	65-66
	Varian	2010, 2510, 9000 Star/9000 Series, Prostar 210/215	67-68
	Waters	6K/6KA, Alliance, 2690, 2695, 2790, 2795, M45/45G, M501, 510, 515, 590, 600/600E, 610, 616, 625/626, 650, 6000, 6000A, DeltaPrep 3000 (#4 and #6 Heads), 1525, 1515	69-72

# opti-max<sup>®</sup>

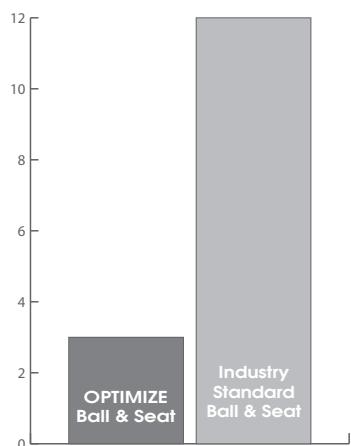
## check valves



Check valves are a crucial, yet often overlooked component of the HPLC system. While a properly functioning check valve is virtually unnoticeable, an improperly functioning check valve can lead to a noisy baseline, pressure fluctuations, and inconsistent flow. Because a check valve can have such a large impact on the performance of your pump, it is imperative when choosing your replacement check valves to select the very best. Of course, we believe that the Opti-Max check valve system is the very best - otherwise we wouldn't sell it.

Read on for the innovations we have implemented in our check valves. And as with any Optimize part—if you're not satisfied, return it for a refund.

Bubbles of nitrogen/minute  
at 90 psi which leak from  
ball & seat.



### A Better Check Valve

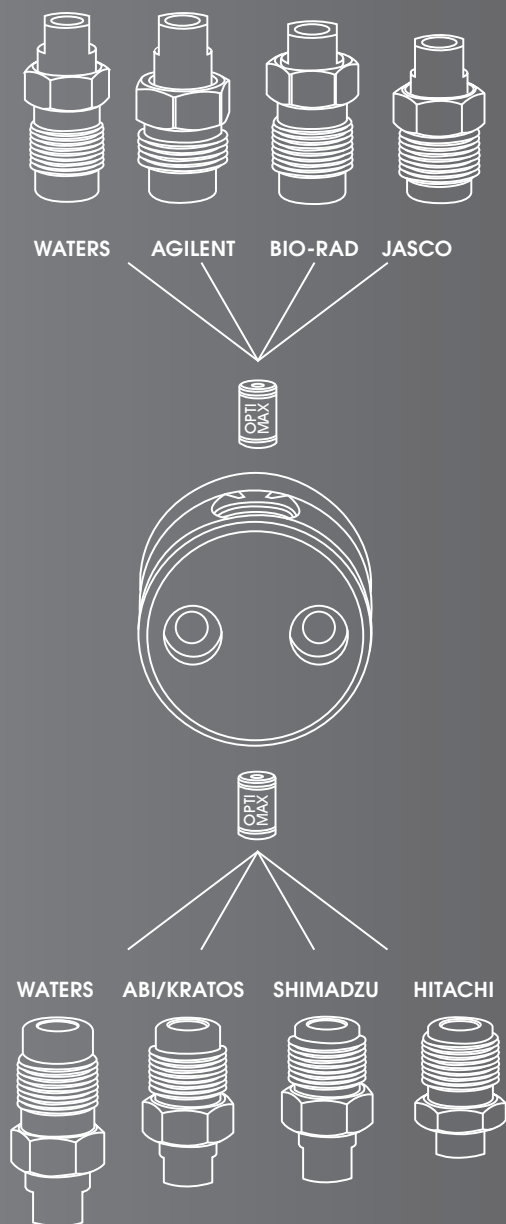
Tighter specifications make a better valve. A check valve can only function effectively if it activates and seals properly in response to the piston cycle. The seating process is fairly simple - the ball lands on the seat and creates a seal - but there are many factors that contribute to optimal seating. At Optimize, we engineer our check valves to be as responsive as possible, scrutinizing every detail.

Each ball and seat set is individually matched to ensure a lock-and-key fit. This guarantees 3 bubbles/minute or less in the industry standard nitrogen bubble test; common acceptable standards are 12 bubbles or less. We have also minimized the ball travel distance within the check valve; less travel distance equals quicker seating and more accurate pump metering.

# opti-max<sup>®</sup>

cartridges

## a universal solution



A single Opti-Max cartridge is interchangeable across multiple pump brands and can function in either the inlet or outlet position.

The same Opti-Max cartridge will fit into Opti-Max housings for pumps manufactured by Waters, Shimadzu, Agilent/HP, and many other OEM solvent delivery systems.

The modular cartridge system allows you to minimize the number of spare check valve cartridges you keep on hand and dramatically reduce the cost of inventory required to cover your maintenance needs.



# opti-max<sup>®</sup>

## free-turn housing

"Make it easier for the user" is the mantra at Optimize. We were the first to introduce the concept of the Opti-Max Free-Turn<sup>®</sup> housing where the thread that tightens a check valve housing into the pump head spins independently from the inner housing body. This enables you to change out a check valve without having to disconnect any tubing - an idea born in efficiency.

Most Opti-Max check valve housings feature the Free-Turn design. To see if they are available for your system, look for the Free-Turn logo  next to the Opti-Max listings for your HPLC.

**opti-max<sup>®</sup> FREE-TURN<sup>®</sup>** housings can be removed with the tubing still attached, accelerating check valve maintenance while reducing fitting wear.

## FREE-TURN<sup>®</sup> IN ACTION



1 Place wrench on the hex nut and turn. The hex nut or thread ring will turn independently of the fitting connection.



2 Continue to unscrew the thread ring until the entire check valve assembly is removed from the pump head.



3 Discard old check valve cartridge & replace with new cartridge.



4 Install entire assembly into pump head.



## Our Recommendation: **Stainless/Ceramic**

For high mechanical strength, stainless steel cartridges are the best choice. Ceramic ball & seat sets have higher density, which can make the valve more responsive and help the ball seat faster in lighter solvents.

For biocompatible HPLC systems with nonmetallic flow paths or high percentages of THF, use PEEK cartridges with ceramic balls & seats.

Both cartridge body materials listed above are also available with ruby and sapphire ball & seat combos. Each pair is matched to the same exacting standards as our ceramic ball/seat sets.



### CARTRIDGE MATERIAL OPTIONS | 2 PACKS

1/32"	10-39-02004	Cartridge fits in all housings that will take 1/16" and 1/8" cartridge. This size is only available in PEEK/PPS body with ruby/sapphire ball & seat.
1/16"	10-46-02004	<b>Recommended:</b> Microbore stainless steel cartridge body with ceramic ball & seat
	10-48-02004	Microbore PEEK cartridge body with ceramic ball & seat
	10-47-02004	Microbore stainless steel cartridge body with ruby ball & sapphire seat
	10-49-02004	Microbore PEEK cartridge body with ruby ball & sapphire seat
1/8"	10-56-02004	<b>Recommended:</b> Standard stainless steel cartridge with ceramic ball & seat
	10-58-02004	Standard PEEK cartridge body with ceramic ball & seat
	10-57-02004	Standard stainless steel cartridge with ruby ball & sapphire seat
	10-59-02004	Standard PEEK cartridge body with ruby ball & sapphire seat
3/16"	10-66-02005	<b>Recommended:</b> Stainless steel cartridge with ceramic ball & seat
	10-68-02005	PEEK cartridge with ceramic ball & seat
	10-67-02005	Stainless steel cartridge with ruby ball & sapphire seat
	10-69-02005	PEEK cartridge with ruby ball & sapphire seat



1/16"	10-76-02004	OPTI-MAX EXP Single Ball & seat Cartridge - Rated to 18,000 psi (1,250 bar) stainless steel cartridge body with ceramic ball & seat.
	10-86-02004	OPTI-MAX EXP Double Ball & Seat Cartridge - Rated to 20,000 psi (1,400 bar) Stainless steel cartridge body With ceramic balls & seats.

\*We cannot guarantee the Opti-Max check valve cartridge will fit in OEM housings. Opti-Max cartridges must be used with Opti-Max housing for optimal results.

# seals&pistons

Seals and pistons are, by design, a consumable part of the HPLC pump and should be replaced on a regular preventative maintenance schedule. To maintain peak performance and avoid unplanned downtime, piston seals should be replaced every three to six months while sapphire pistons require inspection every six months with yearly or as-needed replacement.

## seals



Optimize Piston Seals are the longest lasting seals on the market. Machined from either of two proprietary polymer blends, UHMW-PE or ITB, Optimize Seals provide the ultimate in high pressure sealing capacity. For mostly aqueous buffered mobile phases, Opti-Seal UHMW-polyethylene is the wisest choice. Specially designed to be more resistant to abrasion and wear than standard polyethylene seals, they can last up to seven times longer under mostly aqueous conditions. Despite the UHMW-PE's durability, it has a coefficient of friction approaching that of PTFE. The homogenous polymer nature leads to less shedding, but when it does occur, a larger, more fibrous particle is produced which is easily caught by a filter frit.

PTFE-based Improved Blend (ITB) seals are a superior choice for applications with elevated temperatures, high organic content, or when the broadest possible solvent compatibility is required. ITB seals tend to be softer than those made from UHMW-PE, making them more forgiving at high pressures where piston side-loading or misalignment may occur. This softer nature also leads to more shedding, but the ITB proprietary blend is designed to shed particles that are large enough to be caught at the surface of a standard 2  $\mu$ m frit, not embed within it.

## pistons

Optimize sapphire pistons offer optimal concentricity and resistance to wear. Each sapphire rod is specifically cut in relation to the grain of the crystal lattice, yielding maximal resistance to breakage and superior wear characteristics. Attachment of the rod to the piston ferrule is performed through a proprietary process ensuring concentricity. This is an important, often overlooked procedure parameter that has a direct effect on seal lifetime.



# seal form tool kit

Installing a piston seal can be a tricky undertaking. A relatively small seal must be fit into the seal cavity in such a way to ensure that it is pressed in evenly without distortion or damage. The Optimize Seal Forming/Insertion Tool Kit was specifically designed to aid in this endeavor.

This kit contains three tools to accommodate all of your HPLC piston seals. One end has a beveled cavity for seal forming, while the other is an insertion support for perfect seal installation. Also included with each kit are complete instructions for maximizing seal life and a solvent compatibility guide to aid in prudent seal material selection.

This kit includes three sizes assuring the perfect seal fit every time



Forming cavities in three different sizes lets you pick the best tool for the seal you are installing.



The piston seal is formed by pressing the tool onto the seal jacket.



Then, the seal is pressed into the pump head seal cavity using the insertion support.

## Seal Forming/Insertion Tool

10-10-02695

Seal Forming/Insertion Tool Kit Includes: Three Forming/Insertion Tools (Small, Medium, Large), Instruction Booklet & Solvent Compatibility Chart

**Tip:** For best performance, always use methanol or isopropanol to presoak piston seals for five to ten minutes prior to installation and wet all mating surfaces (seal, piston, seal cavity) as the seal is formed and installed.

# opti-max<sup>®</sup> conversion kits

Make the switch to Opti-Max for less than ever before with Opti-Max Conversion Kits. These kits contain all the check valves you need for your HPLC pump grouped under a single part number and priced at **over 20% off list!**

Each kit includes all the Opti-Max check valve housings and cartridges you need to convert your HPLC instrument. Simply find your HPLC pump/brand model in the list below and use the conversion kit part number to order. By default, each kit includes our recommended Opti-Max cartridge—the stainless steel/ceramic Opti-Max (PEEK cartridges are supplied for biocompatible systems). However, if you'd like to substitute an alternate material the kit price will not be affected.



Bio-Rad  
23-56-02139



Dionex  
25-58-01242



Hitachi  
28-46-02148



LDC  
31-56-02153

BRAND	MODEL	CONVERSION KIT PART #	INLETS	OUTLETS
ABI/Kratos	Spectraflow 400	<b>21-56-02136</b>	1	1
Agilent/HP	1090 Systems	<b>27-38-01959</b>	1	1
	1050/1100/1200	<b>27-56-01330</b>	0	1
Beckman	100A, 126,	<b>22-66-02137</b>	2	2
	110A/B, 112/114, 116	<b>22-66-02138</b>	1	1
Bio-Rad	1330, 1350	<b>23-56-02139</b>	2	2
Bischoff	2200 Microbore	<b>24-46-02141</b>	1	1
	2200, SM909, 760	<b>24-56-02140</b>	1	1
Dionex	DQP, GPM-1, DRP, DP-1	<b>25-58-02143</b>	1	1
	GPM-2, XP, AGP, 2000, 4000		1	1
GBC	1150, 1120	<b>47-46-02271</b>	1	1
	1150, 1120	<b>47-48-02271</b>	1	1
Gilson/Rainin	5, 10, & 25 mL Head	<b>26-56-02144</b>	1	1
Gynkotec	300, M480,	<b>44-46-02145</b>	1	1
Hitachi	655, L-6000, L-6200, L-6200A	<b>28-46-02147</b>	1	1
	7100	<b>28-46-02148</b>	1	1
ISCO	2300, 2350	<b>29-66-02149</b>	1	1
Jasco	BIP-1	<b>42-56-02150</b>	2	2
	880, 980	<b>42-56-02151</b>	1	1

# opti-max<sup>®</sup>

## conversion kits

BRAND	MODEL	CONVERSION KIT PART #	INLETS	OUTLETS
Kontron	420, 422	45-46-02223	1	1
LDC/Milton Roy	Minipump, Minimetric	31-56-02152	1	1
	Constametric, Mini Duplex	31-56-02153	2	2
LKB/Amersham/ Pharmacia	2150, 2248	32-46-02154	2	2
Perkin-Elmer	Series 1, 2, 3, 3B	33-56-02155	2	2
	Series 10	33-56-02156	1	1
	4, 200, 400, 410, 4000, 250	33-56-02157	2	1
Shimadzu	LC-600/9A, LC-10AD	34-46-02158	2	2
	LC-10AT, LC-10ATVP	34-46-02160	1	1
	LC-10ADVP/LC-20AD/LC-20AB/ LC2010	34-46-02627	2	2
	LC-6A, LC-10AS	34-56-02159	1	1
	LC-8A	34-66-02114	2	2
	LC-20ABXR, LC-20ABXR	34-86-04139	2	2
Spectra-Physics	8700, 8800, 8810, IsoChrom	35-56-02161	1	1
	P-Series	35-56-02162	1	1
SSI	200 Series, Model 300	36-56-02163	1	1
Thermo-Electron	Surveyor L-Pump	50-46-03645	1	1
Varian	9000 Star, 9010, 9012	38-56-01704	0	1
	2010	38-56-02164	2	2
	2510	38-56-02165	1	1
Waters	616	39-46-02168	2	2
	625/626	39-48-02170	2	2
	Alliance 2690, 2695, 2790, 2795	39-46-02187	2	0
	100µL/Dual Head Systems	39-56-02166	2	2
	100µL/Single Head Systems	39-56-02186	1	1
	Extended Flow Systems	39-66-01712	1	1
	225µL/Head	39-66-02167	2	2
	400µL & 900µL/Head	39-66-02169	0	2



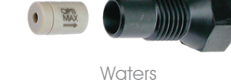
Perkin Elmer  
33-56-02157



Shimadzu  
34-46-02158



Waters  
39-46-02187



Waters  
39-48-02170

# abi, kratos, sysmex & gynkotech



OPTI-MAX for ABI, Kratos,  
& Gynkotech

## opti-max<sup>®</sup> check valves

### ABI/Kratos Spectraflow 400

		OEM #
21-56-00451	OPTI-MAX Inlet Housing & Cartridge	7200-0060, 1400-1999
21-56-00460	OPTI-MAX Outlet Housing & Cartridge	7200-0062, 1400-2250
10-56-02004	OPTI-MAX Replacement Cartridges, 1/8" ball, 2/Pk	

### Gynkotech 300 & M480

		OEM #
44-46-00451	OPTI-MAX Inlet Housing & Cartridge	5005-3200
44-46-00460	OPTI-MAX Outlet Housing & Cartridge	5005-3100
10-46-02004	OPTI-MAX Replacement Cartridges, 1/16" ball, 2/Pk	

OPTIONS: Stainless steel/ceramic OPTI-MAX cartridges are listed above.  
For other options, please see page 45.

## seals & pistons

### ABI/Kratos Spectraflow 400

		OEM #
21-36-00437	OPTI-SEAL UHMW PE* Piston Seal, w/Backup Ring	7200-0087, 7200-0088
21-36-00439	OPTI-SEAL UHMW PE* Piston Seal, w/Backup Ring, 10/Pack	7200-0087, 7200-0088
21-34-00434	Sapphire Piston	1400-1970

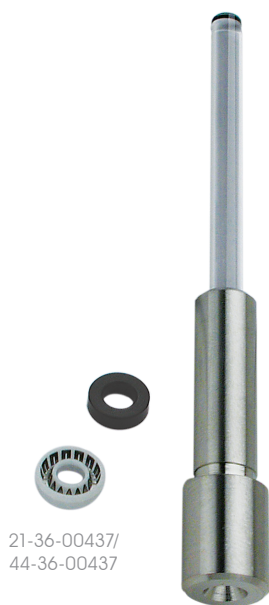
### Gynkotech 300 & M480

		OEM #
44-36-00437	OPTI-SEAL UHMW PE* Piston Seal w/Backup Ring	2266-0304
44-36-00439	OPTI-SEAL UHMW PE* Piston Seal, w/Backup Ring 10/Pack	
44-34-00434	Sapphire Piston	2267-0032

### Sysmex CA1000, CA500

21-36-00437	OPTI-SEAL UHMW PE* Piston Seal
21-36-00439	OPTI-SEAL UHMW PE* Piston Seal, 10/Pack

\*UHMW PE - Ultra High Molecular Weight Polyethylene



21-36-00437/  
44-36-00437

21-34-00434/  
44-34-00434

## lamps

### ABI/Kratos Spectraflow 400, Gynkotech 300 & M480

		OEM #
44-32-02838	DoubleLife™ Deuterium Lamp, for Gynkotech SP6	
21-32-02812	Deuterium Lamp, SF 757, 759A, 770, 773, 783, 783A, 785A, 970, 980, 15X, 120A, 130A, 230A, 270A, 471A	2900-0489



ABI/Kratos  
21-32-02812



# agilent / hewlett-packard

## Purge Valve Upgrade Kit for Agilent/HP 1100/1050

In-line filtration is a necessity for protecting downstream components from damage and blockages due to particulates. The placement of the Agilent/HP PTFE filter is buried deep within the pump head, making what is usually a quick job into a laborious procedure. What use is a filter if it is never replaced? Optimize continues its tradition of innovative solutions with the Purge Valve Upgrade Kit.

The Purge Valve Upgrade Kit resolves this difficulty by permanently replacing the PTFE filter with a low volume PEEK insert and then relocating the filter frit to an easily accessible holder on the side of the purge valve. What once was a cumbersome process of changing the filter becomes a quick and easy task.



Our **FREE-TURN®** filter holder lets you change frits without removing any tubing.

### Purge Valve Upgrade Kit

<b>27-31-02277</b>	Purge Valve Upgrade Kit for Agilent/HP 1100, 1050 Includes: Filter Holder, PEEK Insert and 2 Filter Elements (2.0 $\mu$ m)
<b>10-04-00100</b>	Replacement Frits, 0.5 $\mu$ m, 10/Pk
<b>10-04-00103</b>	Replacement Frits, 2.0 $\mu$ m, 10/Pk



# agilent / hewlett-packard (continued)



OPTI-MAX for Agilent

Active Inlet  
Check Valve CartridgeAgilent/HP 1090, Outlet  
Housing & Cartridge

27-36-01570



27-36-02364



27-36-02366



27-36-01572



27-34-00658



27-36-00663



27-36-00665



27-34-00671

## opti-max check valves

Agilent/HP 1050, 1100, 1200

OEM #

27-56-01330 OPTI-MAX Outlet Housing &amp; Cartridge G1311-60012, G1312-60012

10-56-02004 OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk

27-38-02363 Replacement Cartridge for Active Inlet Valve 5062-8562

OPTIONS: Stainless Steel/Ceramic OPTI-MAX Cartridges are listed above.  
For other options, please see page 45.

## oem-type check valves

Agilent/HP 1090

OEM #

27-38-00680 Inlet Housing &amp; Cartridge 79835-25211

27-38-00682 Outlet Housing &amp; Cartridge 79835-25211

27-38-00672 Replacement Cartridges, 2/Pk 79835-67101

## seals, pistons & other parts

Agilent/HP 1050, 1100

OEM #

27-36-01570 OPTI-SEAL UHMW-PE\* Piston Seal 0905-1420

27-36-01571 OPTI-SEAL UHMW-PE\* Piston Seal, 10/Pk

27-36-01572 ITB PTFE\*\* Piston Seal 5063-6589

27-36-01573 ITB PTFE\*\* Piston Seal, 10/Pk

27-36-03073 PTFE\*\*\* Pump Seal, Green, Premium Grade

27-36-03074 PTFE\*\*\* Pump Seal, Green, Premium Grade, 10/Pk

27-36-02364 OPTI-SEAL UHMW-PE\* Wash Seal 0905-1175

27-36-02365 OPTI-SEAL UHMW-PE\* Wash Seal, 10/Pk

27-36-02366 ITB PTFE\*\* Wash Seal 0905-1175

27-36-02367 ITB PTFE\*\* Wash Seal, 10/Pk

27-36-02851 Gasket Wash Seal, 6/Pk 5062-2484

27-04-02852 PTFE Frits, 5/Pk 01018-22707

27-31-02853 2-in-1 Seal Cap (See adjacent page.) 5062-2485, 5001-3707

27-34-00658 Sapphire Piston 5063-6586

Agilent/HP 1090

OEM #

27-36-00663 OPTI-SEAL UHMW-PE\* Piston Seal 0905-1194

27-36-00664 OPTI-SEAL UHMW-PE\* Piston Seal, 10/Pk

27-36-00665 ITB PTFE\*\* Piston Seal 5062-2494

27-36-00666 ITB PTFE\*\* Piston Seal, 10/Pk

27-34-00671 Sapphire Piston 3980-0672

\*UHMW PE - Ultra High Molecular Weight Polyethylene

\*\*ITB PTFE - Improved PTFE Blend

\*\*\*Premium grade PTFE for maximum chemical compatibility and wear resistance

## 2-in-1 Seal Cap for 1050/1100/1200

Our 2-in-1 Seal Cap replaces both the OEM outlet gold seal and outlet cap with a single component. Use it on your purge valve, OEM outlet check valve, or anywhere else on your 1050/1100/1200 system where gold seals and outlet caps are required.

**Agilent/HP 1050, 1100, 1200****OEM #**

27-31-02853	2-in-1 Seal Cap	5062-2485, 5001-3707
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**autosampler replacement parts****Agilent/HP 1100, 1200****OEM #**

27-31-03212	Rotor Seal Assembly	0100-1853
27-31-03215	Needle	G1313-87201
27-31-03329	Needle Seat Assembly	G1313-87101

**Agilent/HP 1050****OEM #**

27-31-03603	Rotor Seal	0101-0626
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**Agilent/HP 1090****OEM #**

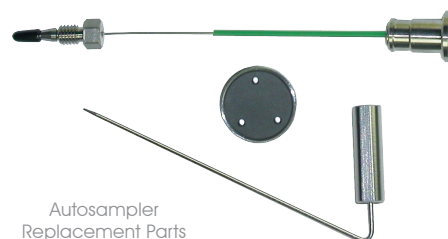
27-31-03649	Rotor Seal, 3 Grooves, Polyimide	7010-039
27-31-03650	Rotor Seal Rebuild Kit	7010-999
27-31-03670	Rotor Seal, 2 Grooves, Polyimide	0101-0623

**lamps****Agilent/HP****OEM #**

27-32-02817	Deuterium Lamp, 1050 VWD A-Series, 79853A	79853-60002
27-32-02827	Deuterium Lamp, 1100 (CE System DAD)	2140-0585
27-32-02844	Deuterium Lamp, 1050C, 1050DAD, 1090, 1040	79883-60002
27-32-02845	DoubleLife™ Deuterium Lamp, 1100, 1200 DAD	5181-1530, 2140-0813
27-32-02846	DoubleLife™ Deuterium Lamp, 1100, 1200 VWD	G1314-60100
27-32-02715	Deuterium Lamp, 1100 VWD G1314A	G1314-60100
27-32-04037	Xenon Lamp, 1100	2140-0600
27-32-04038	Doublelife Deuterium Lamp, 1050	79883-60002



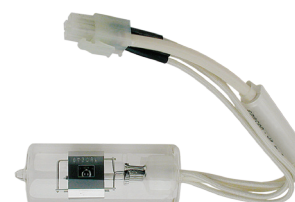
2-in-1 Seal Cap on  
Agilent Purge Valve  
Base



Autosampler  
Replacement Parts



Rotor Seal  
27-31-03603

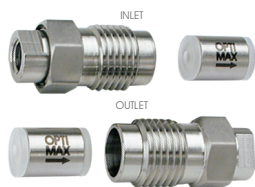


Agilent 1050 VWD A-Series  
27-32-02817



Agilent 1100 DAD  
27-32-02845

# beckman / altex



OPTI-MAX for  
Beckman/Altex



22-36-00498



22-36-00492



22-36-00484



22-36-00486



22-36-00482



22-36-00494



22-34-00475



22-36-00500



22-34-00476



22-32-03659

## opti-max<sup>®</sup> check valves

110A, 110A/B, 112/112M, 114/114M, 116, 118, 125, 126, 127, 128  OEM #

22-66-00516	OPTI-MAX Inlet Housing & Cartridge	240720
22-66-00520	OPTI-MAX Outlet Housing & Cartridge	240721
10-66-02005	OPTI-MAX Replacement Cartridges, 3/16" Ball, 2/Pk	

OPTIONS: Stainless Steel/Ceramic OPTI-MAX Cartridges are listed above.  
For other options, please see page 45.

## seals & pistons

100A, 110A/B

OEM #

22-36-00498	OPTI-SEAL UHMW-PE* Piston Seal	887138, 2530-004
22-36-00499	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
22-36-00492	ITB PTFE** Piston Seal	887138, 2530-004
22-36-00493	ITB PTFE** Piston Seal, 10/Pk	
22-34-00475	Sapphire Piston, 110A/110B, 112/112M	243053, 110-07

105, 110 Prep

OEM #

22-36-00484	OPTI-SEAL UHMW-PE* Piston Seal	887139
22-36-00485	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
22-36-00486	ITB PTFE** Piston Seal	887139
22-36-00487	ITB PTFE** Piston Seal, 10/Pk	

112/112M

OEM #

22-36-00482	OPTI-SEAL UHMW-PE* Piston Seal	236797
22-36-00483	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
22-34-00475	Sapphire Piston, 110A/110B, 112/112M	243053

114/114M, 116, 126

OEM #

22-36-00500	OPTI-SEAL UHMW-PE* Piston Seal	241037
22-36-00501	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
22-36-00496	ITB PTFE** Piston Seal	241037
22-36-00497	ITB PTFE** Piston Seal, 10/Pk	
22-34-00476	Sapphire Piston	240714

\*UHMW PE - Ultra High Molecular Weight Polyethylene

\*\*ITB PTFE - Improved PTFE Blend

## lamps

Beckman/Altex

OEM #

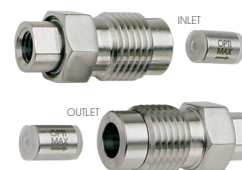
22-32-03659	Deuterium Lamp, Beckman M-168	538711
22-32-02781	Deuterium Lamp, Beckman M-166, Altex 166	239372
22-32-01295	Deuterium Lamp for Beckman M-163	22 947029
22-32-04036	Deuterium Lamp for Beckman DU600, 620, 630, 640, 650, 6000, 7000, 7500	514366

## opti-max<sup>®</sup> check valves

1330, 1350 

		OEM #
23-56-00546	OPTI-MAX Inlet Housing & Cartridge	8001306, 125-0306
23-56-00551	OPTI-MAX Outlet Housing & Cartridge	8001306, 125-0307
10-56-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk	

OPTIONS: Stainless Steel/Ceramic OPTI-MAX Cartridges are listed above.  
For other options, please see page 45.



OPTI-MAX for Bio-Rad

## seals & pistons

1330, 1350, 1350T, 2700, 2800

		OEM #
23-36-00534	OPTI-SEAL UHMW-PE* Piston Seal	9100363, 125-0302
23-36-00535	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
23-36-00531	ITB PTFE** Piston Seal	9100363
23-36-00532	ITB PTFE** Piston Seal, 10/Pk	
23-34-00530	Piston, 1330, 1350, 1350T	8001311, 125-0304

\*UHMW PE - Ultra High Molecular Weight Polyethylene

\*\*ITB PTFE - Improved PTFE Blend



23-36-00534



23-36-00531

## lamps

Bio-Rad

		OEM #
23-32-02081	Deuterium Lamp, Model 1790 Biofocus 300 CE	930-6106
23-32-03119	Deuterium Lamp, REMEDI	



23-34-00530



Bio-Rad  
23-32-02081

# bischoff



## opti-max® check valves

**Bischoff 2200, 2250, Anspec SM909,  
Alcott Micromeritics 760, 765 (Analytical Versions)**



**OEM #**

24-56-00576	OPTI-MAX Inlet Housing & Cartridge	2200-0220, 760/25602/00
24-56-00581	OPTI-MAX Outlet Housing & Cartridge	2200-0230, 760/25604/00
10-56-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk	

**Bischoff 2200, Anspec SM909,  
Alcott Micromeritics 760 (Microbore Versions), 765**



**OEM #**

24-46-00585	OPTI-MAX Inlet Housing & Cartridge	2200-0120, 760/25602/01
24-46-00589	OPTI-MAX Outlet Housing & Cartridge	2200-0130, 760/25604/01
10-46-02004	OPTI-MAX Replacement Cartridges, 1/16" Ball, 2/Pk	

OPTIONS: Stainless Steel/Ceramic OPTI-MAX Cartridges are listed above.  
For other options, please see page 45.

## seals & pistons

**Bischoff 2200, Anspec SM909,  
Alcott Micromeritics 760, 765 (Analytical Versions)**

**OEM #**

24-36-01297	OPTI-SEAL UHMW-PE* Piston Seal	2200-0212, 760/25601/00
24-36-01298	OPTI-SEAL UHMW-PE* Piston Seal 10/Pk	
24-36-01303	ITB PTFE** Piston Seal	2200-0212, 760/25601/00
24-36-01304	ITB PTFE** Piston Seal, 10/Pk	
24-36-00569	Piston Seal Support Ring	2200-0211, 760/25603/00
24-34-00559	Sapphire Piston	2200-0210, 760/25803/00

**Bischoff 2200, Anspec SM909,  
Alcott Micromeritics 760 (Microbore Versions), 765**

**OEM #**

24-36-00571	OPTI-SEAL UHMW-PE* Piston Seal	2200-0112, 760/25601/01
24-36-00572	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
24-36-00573	ITB PTFE** Piston Seal	2200-0112, 760/25601/01
24-36-00575	ITB PTFE** Piston Seal, 10/Pk	
24-36-00574	Piston Seal Support Ring	2200-0111, 760/25603/01
24-34-00562	Sapphire Piston	2200-0110, 760/25803/01

\*UHMW PE - Ultra High Molecular Weight Polyethylene

\*\*ITB PTFE - Improved PTFE Blend

## lamps

**Bischoff**

24-32-02838	DoubleLife™ Deuterium Lamp, Bischoff, Gynkotek SP6, LATEK VISI-6
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## opti-max<sup>®</sup> check valves

GP-40\*/IP-20\*, DQP, GPM-1, DRP, GPM-2, DXP,  
AGP (Analytical), 2000, 4000, GP-50/IP-25

		OEM #
25-58-00613	OPTI-MAX Inlet Housing & Cartridge	047660, 38273
25-58-00612	OPTI-MAX Outlet Housing & Cartridge	047661, 42761
10-58-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk	

OPTIONS: PEEK/ceramic OPTI-MAX cartridges are listed above.  
For other options, please see page 45.

\*The OPTI-MAX Check Valves above fit GP-40/IP-20 pumps. Users of microbore versions of these pumps should order OPTI-MAX microbore (1/16") cartridges. Please see page 45.



OPTI-MAX for  
Dionex



25-36-00597



25-36-00599



25-36-00601



25-34-00596

## pistons & seals

GP-40/IP-20 (Analytical), DQP, GPM-1, DRP, GPM-2, DXP,  
AGP (Analytical), 2000, 4000

		OEM #
25-36-00597	OPTI-SEAL UHMW-PE* Piston Seal (Hastelloy C <sup>®</sup> Spring)	40859
25-36-00598	OPTI-SEAL UHMW-PE* Piston Seal (Hastelloy C <sup>®</sup> Spring), 10/Pk	
25-36-00599	UHMW-PE* Piston Seal, (Elastomer O-Ring)	35686
25-36-00600	UHMW-PE* Piston Seal, (Elastomer O-Ring), 10/Pk	
25-36-00601	Back-Up Seal, for all models except GP40/IP20	36901
25-36-00602	Back-Up Seal, 10/Pk	
25-34-00596	Sapphire Piston, for all models except GP40/IP20	36904

\*UHMW PE - Ultra High Molecular Weight Polyethylene

## lamps

Dionex		OEM #
25-32-02081	Deuterium Lamp, Dionex VDM-1, DSA-1	
25-32-02820	Deuterium Lamp, Dionex CES 1, VDM-2	40651



Dionex  
25-32-02081

# hitachi



OPTI-MAX for 655, L-6000,  
L-6200/L-6200A



OPTI-MAX for  
L-7100



28-36-00690



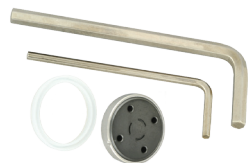
28-36-00688



28-36-00691



28-34-00685



28-31-03650



Hitachi  
28-32-02829

## opti-max® check valves

### 655, L-6000, L-6200/L-6200A

#### OEM #

28-46-00703	OPTI-MAX Inlet Housing & Cartridge	ANO-0833, 885-1330
28-46-00712	OPTI-MAX Outlet Housing & Cartridge	ANO-0834, 885-1331
10-46-02004	OPTI-MAX Replacement Cartridges, 1/16" Ball, 2/Pk	

### L-7100 (LaChrom), L-2130

#### OEM #

28-46-02092	OPTI-MAX Inlet Housing & Cartridge	ANO-0836, 810-1004, 809-1408
28-46-02094	OPTI-MAX Outlet Housing & Cartridge	ANO-0837, 810-1005, 809-1409
10-46-02004	OPTI-MAX Replacement Cartridges, 1/16" Ball, 2/Pk	

OPTIONS: Stainless steel/ceramic OPTI-MAX cartridges are listed above.  
For other options, please see page 45.

### L-2100, Smash Pump, L-2130

28-39-02092	OPTI-MAX Inlet Housing & Cartridge	
28-39-02094	OPTI-MAX Outlet Housing & Cartridge	
10-39-02004	OPTI-MAX Check Valve Cartridge Replacement, Microbore 1/32", 2/Pk	

## seals & pistons

### 655, L-6000, L-6200/L-6200A, L-7100 (LaChrom), L-2100, Smash Pump

#### OEM #

28-36-00690	OPTI-SEAL UHMW-PE* Piston Seal	655-1080
28-36-00692	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
28-36-00688	ITB PTFE** Piston Seal	655-1080
28-36-00689	ITB PTFE** Piston Seal, 10/Pk	
28-36-00691	OPTI-SEAL UHMW-PE* Piston Seal with Hastelloy C <sup>®</sup> Spring	
28-36-00693	OPTI-SEAL UHMW-PE* Piston Seal with Hastelloy C <sup>®</sup> Spring, 10/Pk	
28-34-00685	Sapphire Piston	810-1033

\*UHMW PE - Ultra High Molecular Weight Polyethylene

\*\*ITB PTFE - Improved PTFE Blend

## autosampler replacement parts

### 7200, 7250

#### OEM #

28-31-03650	Polyimide Rotor Seal Rebuild Kit	ANO-0818
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## lamps

### Hitachi

#### OEM #

28-32-02375	Deuterium Lamp, L-7000 Series, L-2400, L-3500, L-4000 Series	885-3570
28-32-02829	Deuterium Lamp, Hitachi 200, 300, 330, 340, 1500, 1800, 2000, 2001, 2800, 2810, 3200, L2500, -3000, -3100, U-Series, 655A, 150-20	ANO-0424, 890-2430
28-32-03928	Deuterium Lamp, Lachrom/Merck L-Series (excluding L-7000)	ANO-0424, 890-2430



## opti-max<sup>®</sup> check valves

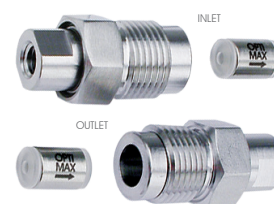
### BIP 1

		OEM #
42-56-01038	OPTI-MAX Inlet Housing & Cartridge	6260-H101A
42-56-01043	OPTI-MAX Outlet Housing & Cartridge	6260-H102A
10-56-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk	

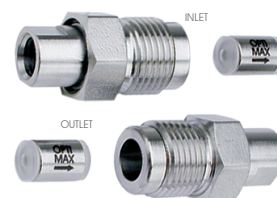
### 880/980 Series

		OEM #
42-56-01544	OPTI-MAX Inlet Housing & Cartridge	6560-H405A
42-56-01546	OPTI-MAX Outlet Housing & Cartridge	6560-H404A
10-56-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk	

OPTIONS: Stainless steel/ceramic OPTI-MAX cartridges are listed above.  
For other options, please see page 45.



OPTI-MAX for BIP 1



OPTI-MAX  
For 880/980 Series

## seals & pistons

### BIP-1, PU-2080, 2085, 2089, 1580-C02, 980, 880, 1586, 2086, 986

		OEM #
42-36-01357	OPTI-SEAL UHMW-PE* Piston Seal	6560-H148, H149A
42-36-01358	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
42-36-01355	ITB PTFE** Piston Seal	6560-H148-PE, H149A
42-36-01356	ITB PTFE** Piston Seal, 10/Pk	
42-34-01354	Sapphire Piston	2305-0005A

\*UHMW PE - Ultra High Molecular Weight Polyethylene

\*\*ITB PTFE - Improved PTFE Blend



42-36-01357



42-36-01355

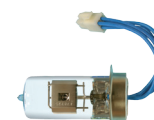


42-34-01354

## lamps

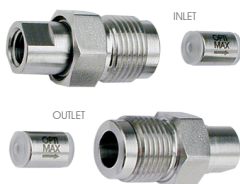
### Jasco

		OEM #
42-32-02841	DoubleLife™ Deuterium Lamp, 870, 875	5330-0097
42-32-02842	DoubleLife™ Deuterium Lamp, UV-1570, -1575, -2070, -2075, 975 B/C Series	5330-0091



42-32-02842

# lkb / amersham / pharmacia



**OPTI-MAX**  
For LKB/Pharmacia

## opti-max® check valves

**LKB 2150, 2248, 2500**

**OEM #**

<b>32-46-00782</b>	OPTI-MAX Inlet Housing & Cartridge	80-1035-19
<b>32-46-00787</b>	OPTI-MAX Outlet Housing & Cartridge	2150-300
<b>10-46-02004</b>	OPTI-MAX Replacement Cartridges, 1/16" Ball, 2/Pk	

**OPTIONS:** Stainless steel/ceramic OPTI-MAX cartridges are listed above.  
For other options, please see page 45.



32-36-01303



32-36-01297



32-34-00771

## seals & pistons

**LKB 2150, 2248, 2500**

**OEM #**

<b>32-36-01297</b>	OPTI-SEAL UHMW-PE* Piston Seal with Back-Up Ring	80-1037-39
<b>32-36-01298</b>	OPTI-SEAL UHMW-PE* Piston Seal with Back-Up Ring, 10/Pk	
<b>32-36-01303</b>	ITB PTFE** Piston Seal, with Back-Up Ring	80-1037-39
<b>32-36-01304</b>	ITB PTFE** Piston Seal, with Back-Up Rings, 10/Pk	
<b>32-34-00771</b>	Sapphire Piston, 2150	80-1035-52

\*UHMW PE - Ultra High Molecular Weight Polyethylene

\*\*ITB PTFE - Improved PTFE Blend

## lamps

**LKB/Amersham/Pharmacia**

**OEM #**

<b>32-32-02821</b>	Deuterium Lamp, LKB Ultraspec I, II, III, Plus, 4050, 4051, 4054, 2141, 2151	
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## opti-max® check valves

### Series 1, 2, 3, 3B, 10

		OEM #
33-56-00840	OPTI-MAX Inlet Housing & Cartridge	0254-0546
33-56-00845	OPTI-MAX Outlet Housing & Cartridge	0254-0547
10-56-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk	

### Model 250, Series 4, 200\*, 400, 410, 620, Integral 4000\*

		OEM #
33-56-00830	OPTI-MAX Inlet Housing & Cartridge	0254-0177
33-56-00835	OPTI-MAX Outlet Housing & Cartridge	0254-0197
10-56-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk	

OPTIONS: Stainless steel/ceramic OPTI-MAX cartridges are listed above.  
For other options, please see page 45.

\*These pumps have an intermediate check valve which is identical to the inlet check valve; to order a replacement intermediate valve, use the OPTI-MAX inlet part number.

## seals & pistons

### Model 250, Series 200, 410, 620, Integral 4000 (Mfd. After 12/89)

		OEM #
33-34-00798	Piston (High Pressure)	N260-0124
33-34-00797	Piston (Low Pressure)	N260-0104

### Model 250, Series 4, 200, 400, 410, 620, Integral 4000, Series 1, 2, 3, 3B, 10

		OEM #
33-36-01301	OPTI-SEAL UHMW-PE* Piston Seal (High Pressure)	0990-7324
33-36-01302	OPTI-SEAL UHMW-PE* Piston Seal (High Pressure), 10/Pk	
33-36-01299	ITB PTFE** Piston Seal (High Pressure)	0990-7328
33-36-01300	ITB PTFE** Piston Seal (High Pressure), 10/Pk	

### Series 4, 400, 410, 620, Integral 4000

		OEM #
33-36-00804	OPTI-SEAL UHMW-PE Piston Seal (Low Pressure)	0990-7330
33-36-00805	OPTI-SEAL UHMW-PE Piston Seal (Low Pressure), 10/Pk	
33-36-00802	ITB PTFE Piston Seal (Low Pressure)	0990-7330
33-36-00803	ITB PTFE Piston Seal (Low Pressure), 10/Pk	

### Series 100

		OEM #
33-36-00806	OPTI-SEAL UHMW-PE* Piston Seal	N260-0108
33-36-00807	OPTI-SEAL UHMW-PE* Piston Seal , 10/Pk	
33-36-00808	ITB PTFE** Piston Seal N260-0109	
33-36-00809	ITB PTFE** Piston Seal, 10/Pk	

\*UHMW PE - Ultra High Molecular Weight Polyethylene

\*\*ITB PTFE - Improved PTFE Blend

## lamps

### Perkin-Elmer

		OEM #
33-32-03117	Deuterium Lamp, 200 UV/Vis	N292-0149
33-32-03114	DoubleLife™ Deuterium Lamp, Series 200 DAD	N292-2046



Series 1, 2, 3, 3B, 10



Model 250, Series 4, 200,  
400, 410, 620, Integral  
4000



33-34-00798



33-34-00797



33-36-01301



33-36-01299



33-36-00804



33-36-00802



33-36-00806



33-36-00808



33-32-03114

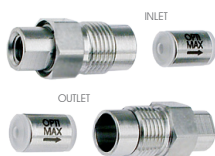
# shimadzu



LC-10AT, LC-10ATVP



LC-10ADVP



LC-10AD, LC-600, LC-9A



LC-10AS, LC-6A



LC-8A



Shimadzu  
34-32-02837

## opti-max® check valves

### LC-10AT, LC-10ATVP

<b>34-46-01983</b>	OPTI-MAX Inlet Housing & Cartridge
<b>34-46-00893</b>	OPTI-MAX Outlet Housing & Cartridge
<b>10-46-02004</b>	OPTI-MAX Replacement Cartridges, 1/16" ball, 2/Pk

### Shimadzu #

228-32166-91
228-39093-92, 228-32531-92
228-34976-91

### LC-10ADVP, LC-20AD/LC-20AB (Prominence), LC-2010, GPC-20 & 50 (100 µL Head), ESA Models 582 & 584

<b>34-46-02644</b>	OPTI-MAX Inlet Housing & Cartridge
<b>34-46-00893</b>	OPTI-MAX Outlet Housing & Cartridge
<b>10-46-02004</b>	OPTI-MAX Replacement Cartridges, 1/16" ball, 2/Pk

### Shimadzu #

228-39093-92
228-45704-91
228-34976-91
228-45705-91
228-37147-93

### ESA #

70-4056
70-4057

### LC-20ABXR

<b>34-86-02644</b>	OPTI-MAX Inlet Housing & Cartridge
<b>34-86-00893</b>	OPTI-MAX Outlet Housing & Cartridge
<b>10-86-02004</b>	OPTI-MAX Replacement Cartridges 1/16" ball, 2/Pk

### Shimadzu #

228-48249-91
228-45705-91

### LC-10AD, LC-600, LC-9A (also ESA Model 580)

<b>34-46-00885</b>	OPTI-MAX Inlet Housing & Cartridge
<b>34-46-00893</b>	OPTI-MAX Outlet Housing & Cartridge
<b>10-46-02004</b>	OPTI-MAX Replacement Cartridges, 1/16" ball, 2/Pk

### Shimadzu #

228-18522-91
228-33492-91
228-18522-92
228-32531-92

### ESA #

70-0734
70-0735

### LC-10AS, LC-6A

<b>34-56-00902</b>	OPTI-MAX Inlet Housing & Cartridge
<b>34-56-00907</b>	OPTI-MAX Outlet Housing & Cartridge
<b>10-56-02004</b>	OPTI-MAX Replacement Cartridges, 1/8" ball, 2/Pk

### Shimadzu #

228-12353-91
228-09054-93

### LC-8A

<b>34-66-02112</b>	OPTI-MAX Inlet Housing & Cartridge
<b>10-66-02005</b>	OPTI-MAX Replacement Cartridges (for LC-8A Inlet), 3/16" ball, 2/Pk
<b>34-56-00907</b>	OPTI-MAX Outlet Housing & Cartridge
<b>10-56-02004</b>	OPTI-MAX Replacement Cartridges (for LC-8A Outlet), 1/8" ball, 2/Pk

### Shimadzu #

228-20256-91
228-09054-93

OPTIONS: Stainless steel/ceramic OPTI-MAX cartridges are listed above.  
For other options, please see page 45.

## lamps

### Shimadzu #

<b>34-32-02837</b>	DoubleLife™ Deuterium Lamp, SPD-10A, -10AV, -M10A, -10AS, -10AVP, -M10AVP, -20AV	228-34016-02
<b>34-32-02838</b>	DoubleLife™ Deuterium Lamp, SPD-2A, SPD-6A (V), LC-3A, -4A, 6A, SP4, 6500AA	
<b>34-32-03102</b>	DoubleLife™ Deuterium Lamp, LC 2010	228-37401-00

## seals & pistons

### LC-10ADVP, 2010, LC-20AD (also ESA Models 582 & 584)

		Shimadzu #	ESA #
34-36-00855	OPTI-SEAL UHMW-PE* Piston Seal	228-32628-00 228-18745-00	
34-36-00856	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk		
34-36-03472	ITB PTFE** Piston Seal	228-35146-00 228-18745-00	70-3602
34-36-03473	ITB PTFE** Piston Seals, 10/Pk		
34-34-02645	Sapphire Piston for LC-10ADVP, 2010, LC-20AD	228-35601-91 228-35601-92	70-4052 70-4052



34-36-00855



34-34-02645



34-36-00865



34-36-00863



34-34-00854



34-34-01345



34-34-02650



34-36-00857



34-34-00853



34-34-01997



34-04-03881

### LC-6A, LC-7A, LC-10AS, LC-10AT, LC-10ATVP, LC-20AT, SIL-10ADVP, GFP

		Shimadzu #
34-36-00865	OPTI-SEAL UHMW-PE* Piston Seal	228-11999-00, 228-21975-00, 228-35145-00
34-36-00866	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
34-36-00863	ITB PTFE** Piston Seal	228-11999-00, 228-21975-00, 228-35145-00
34-36-00864	ITB PTFE** Piston Seal, 10/Pk	

Piston Wash Users: The above seals can also be used as Back Seals (OEM# 228-28499-00)

34-34-00854	Sapphire Piston for LC-6A	228-12904-93
34-34-01345	Sapphire Piston for LC-10AS	228-17019-93
34-34-01997	Sapphire Piston for LC-10AT (Universal Piston)	228-32654-91
34-34-02650	Sapphire Piston for LC-10ATVP	228-35009-92

### LC-600, LC-9A, LC-10AD (and ESA 580)

		Shimadzu #	ESA #
34-36-00855	OPTI-SEAL UHMW-PE* Piston Seal	228-18745-00	
34-36-00856	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk		
34-36-00857	UHMW-PE* Elastomer Energized Seal	228-18745-00 228-35146-00	
34-36-00858	UHMW-PE* Elastomer Energized Seal, 10/Pk		
34-34-00853	Sapphire Piston	228-18523-91	70-1166
34-36-03472	ITB PTFE** Piston Seal	228-35146-00	70-3602
34-36-03473	ITB PTFE** Piston Seals, 10/Pk		

\*UHMW PE - Ultra High Molecular Weight Polyethylene

\*\*ITB PTFE - Improved PTFE Blend

## Universal Sapphire Piston for Shimadzu LC-10AT

Our Universal Piston System for Shimadzu lets you install LC-10AS plungers into a special reusable housing for use in the LC-10AT. Now, the same piston can be used in both the LC-10AS and 10AT, consolidating your inventory and reducing replacement cost.

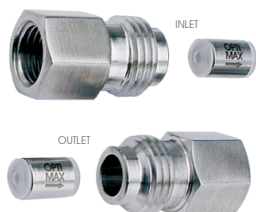
34-34-01997	<b>First Time:</b> LC-10AT Universal Piston Assembly
34-34-01345	<b>Subsequent:</b> LC-10AT piston replacement requires only one LC-10AS piston
34-34-01991	Sapphire Plunger Holder for Shimadzu LC-10AT (requires LC-10AS plunger as insert)

## filtration

### LC-6AD, LC-610, LC-6A, LC-6AEF, LC- 9A, LC-10AD, LC-10AS, LC-10AT

	Shimadzu #
34-04-03881	In-Line Filter Assembly 228-12642-93

ssi



OPTI-MAX for SSI

## opti-max<sup>®</sup> check valves

200 Series, Model 300 (also BAS PM-48, ESA 5700 SDM, DuPont 8800)

OEM #

36-56-00982	OPTI-MAX Inlet Housing & Cartridge	02-0162
36-56-00987	OPTI-MAX Outlet Housing & Cartridge	02-0163
10-56-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk	

OPTIONS: Stainless steel/ceramic OPTI-MAX cartridges are listed above.  
For other options, please see page 45.



## opti-max<sup>®</sup> cartridge upgrades

ULTRA CP



10-76-02004	OPTI-MAX Microbore 1/16" Diameter Ceramic Ball & Seat, SS Replacement Check Valve Cartridges w/ flangeless PEEK caps (For OEM Housing), 2/Pk Rated for use at 18,000 psi
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36-36-01301



36-36-01299

## seals

200 Series, Model 300

OEM #

36-36-01301	OPTI-SEAL UHMW-PE* Piston Seal	90-1034
36-36-01302	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
36-36-01299	ITB PTFE** Piston Seal	90-1012
36-36-01300	ITB PTFE** Piston Seal, 10/Pk	

\*UHMW PE - Ultra High Molecular Weight Polyethylene

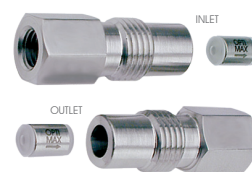
\*\*ITB PTFE - Improved PTFE Blend

# thermo: ldc / milton roy

## opti-max<sup>®</sup> check valves

All Analytical (including Constametric, Minimetric, Minipump)		OEM #
31-56-00759	OPTI-MAX Inlet Housing & Cartridge	900947001
31-56-00764	OPTI-MAX Outlet Housing & Cartridge	900947002
10-56-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk	

OPTIONS: Stainless steel/ceramic OPTI-MAX cartridges are listed above.  
For other options, please see page 45.



OPTI-MAX for LDC

## check valve fittings

All Analytical (including Constametric, Minimetric, Minipump)		OEM #
31-24-00735	1/8" Nut & Ferrule, for Suction Tube	1960066976
31-24-00736	1/16" Nut & Ferrule, for Discharge Tube	1960066975



31-24-00735

## seals & pistons

All Analytical (including Constametric, Minimetric, Minipump)		OEM #
31-36-00806	OPTI-SEAL UHMW-PE* Piston Seal	206234
31-36-00807	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
31-36-00754	OPTI-SEAL Replacement Kit	801598
31-36-00808	ITB PTFE** Piston Seal, Black	206129001
31-36-00809	ITB PTFE** Piston Seal, Black, 10/Pk	
31-36-00750	Seal Replacement Kit, ITB	801598
31-36-00745	UHMW-PE* Piston Seal, Gold	206234
31-36-00746	UHMW-PE* Piston Seal, Gold, 10/Pk	
31-36-00747	Seal Replacement Kit, Gold	801892001
31-34-00738	Sapphire Piston	801306
31-34-00739	Crosshead Spring, Constametric II, Mini-pump	9160282000
31-34-00740	Crosshead Spring, Minimetric	204040

\*UHMW PE - Ultra High Molecular Weight Polyethylene

\*\*ITB PTFE - Improved PTFE Blend



31-24-00736



31-36-00806



31-36-00808



31-36-00745

## lamps

LDC/Milton Roy		OEM #
31-32-01295	Deuterium Lamp, 3000 and 4000 Series, Spectromonitor I-II-III-D	108035
31-32-02824	Deuterium Lamp, 5000 (PDA)	



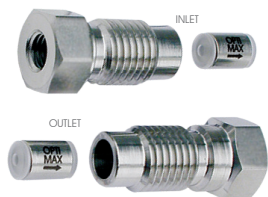
31-34-00738



31-32-01295



# thermo: spectra-physics



OPTI-MAX for  
Spectra-Physics

## opti-max<sup>®</sup> check valves

### 8700, 8800, 8810, IsoChrom, P-Series

		OEM #
35-56-00956	OPTI-MAX Inlet Housing & Cartridge	A3495-010
35-56-00961	OPTI-MAX Outlet Housing & Cartridge	A3490-010
35-56-00952	OPTI-MAX Transducer Housing & Cartridge	A3990-010
10-56-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk	

OPTIONS: Stainless steel/ceramic OPTI-MAX cartridges are listed above.  
For other options, please see page 45.



## seals & pistons

### 8800, 8810, IsoChrom, P-Series

		OEM #
35-36-00930	OPTI-SEAL UHMW-PE* Piston Seal	A2962-010
35-36-00931	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
35-36-00938	ITB PTFE** Piston Seal	A2962-010
35-36-00939	ITB PTFE** Piston Seal, 10/Pk	
35-36-00916	Back-Up Seal, PCTFE	A4848-010
35-36-00917	Back-Up Seal, PCTFE, 10/Pk	
35-36-00918	OPTI-SEAL UHMW-PE* Flush Seal	A2963-010
35-36-00919	OPTI-SEAL UHMW-PE* Flush Seal, 10/Pk	
35-36-00920	ITB PTFE** Flush Seal	A2963-010
35-36-00921	ITB PTFE** Flush Seal, 10/Pk	
35-34-00915	Sapphire Piston	A3102-010

### 8700, 8700XR, 8750

		OEM #
35-36-00934	OPTI-SEAL UHMW-PE* Piston Seal	A1703-020
35-36-00935	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
35-36-00936	ITB PTFE** Piston Seal	A1703-020
35-36-00937	ITB PTFE** Piston Seal, 10/Pk	

\*UHMW PE - Ultra High Molecular Weight Polyethylene

\*\*ITB PTFE - Improved PTFE Blend

## lamps

### Thermo: Spectra-Physics

		OEM #
35-32-01333	Deuterium Lamp, Spectra-Physics Focus, 100, 200, UV-100, -150, -200, -100, 2000, 3000, CE Series	9551-0023

# varian, gilson / rainin

## opti-max® check valves

5, 10 & 25 mL S/SC Heads (Gilson, Rainin, ProStar 210/215, HP, HPX, HPXL, SD 200/300)

		OEM #
26-56-00638	OPTI-MAX Inlet Housing & Cartridge	R007101616, R007101678
26-56-00647	OPTI-MAX Outlet Housing & Cartridge	R007101617, R007101679
10-56-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk	



### 2010

		OEM #
38-56-01038	OPTI-MAX Inlet Housing & Cartridge	00-997261-09
38-56-01043	OPTI-MAX Outlet Housing & Cartridge	00-997261-10
10-56-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk	



### 2510

		OEM #
38-56-01544	OPTI-MAX Inlet Housing & Cartridge	00-997554-19
38-56-01546	OPTI-MAX Outlet Housing & Cartridge	00-997554-18
10-56-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk	



9000 Star, 9010, 9012, PROSTAR 220, 230, 240

		OEM #
38-56-01067	OPTI-MAX Outlet Housing & Cartridge	03-919465-90
10-56-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk	



OPTIONS: Stainless steel/ceramic OPTI-MAX cartridges are listed above. For other options, please see page 45.

## seals & pistons

10mL S/SC Heads (Gilson, Rainin, HP, HPX, HPXL, SD 200/300)

		OEM #
26-36-00632	OPTI-SEAL UHMW PE* Piston Seal	5463125895, R007101637
26-36-00633	OPTI-SEAL UHMW PE* Piston Seal, 10/Pk	
26-36-00630	ITB PTFE** Piston Seal	5463125095, R007101636
26-36-00631	ITB PTFE** Piston Seal, 10/Pk	
26-34-00624	Piston, 10 mL S/SC Head	3650009, R007101658



5mL S/SC Heads (Gilson, Rainin, HP, HPX, HPXL, SD 200/300)

		OEM #
26-36-00634	OPTI-SEAL UHMW-PE* Piston Seal	5463088863, R007101634
26-36-00635	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
26-36-00636	ITB PTFE** Piston Seal	5463088063, R007101633
26-36-00637	ITB PTFE** Piston Seal, 10/Pk	
26-34-00625	Piston, 5 mL SC Head	3650008, R007101657



\*UHMW PE - Ultra High Molecular Weight Polyethylene

\*\*ITB PTFE - Improved PTFE Blend

# varian, gilson / rainin (continued)



38-36-01000



38-36-01002



38-34-00999



38-36-01555



38-36-01553



38-34-01342



26-32-01295



38-32-01637

## seals & pistons cont.

### ProStar 210/215 (10 mL Heads)

		OEM #
38-36-00632	OPTI-SEAL UHMW-PE* Piston Seal	R007101637
38-36-00633	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
38-36-00630	ITB PTFE** Piston Seal	R007101636
38-36-00631	ITB PTFE** Piston Seal, 10/Pack	
38-34-00624	Sapphire Piston, 10 mL Head	R007101658

### ProStar 210/215 (5 mL Heads)

		OEM #
38-36-00634	OPTI-SEAL UHMW-PE* Piston Seal	R007101634
38-36-00635	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
38-36-00636	ITB PTFE** Piston Seal	R007101633
38-36-00637	ITB PTFE** Piston Seal, 10/Pk	
38-34-00625	Sapphire Piston, 5 mL Head	R007101657

### 2010, 2510

		OEM #
38-36-01000	OPTI-SEAL UHMW-PE* Piston Seal	00-997261-37
38-36-01001	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
38-36-01002	ITB PTFE** Piston Seal	00-997261-37
38-36-01003	ITB PTFE** Piston Seal, 10/Pk	
38-34-00999	Sapphire Piston	00-997261-08

### 9000 Star, 9010, 9012, 9020, 220, 230, 240

		OEM #
38-36-01555	OPTI-SEAL UHMW-PE* Piston Seal	03-919397-00
38-36-01556	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
38-36-01553	ITB PTFE** Piston Seal	03-919397-00
38-36-01554	ITB PTFE** Piston Seal, 10/Pk	
38-34-01342	Sapphire Piston	03-919180-00, 03-919102-90

\*UHMW PE - Ultra High Molecular Weight Polyethylene

\*\*ITB PTFE - Improved PTFE Blend

## lamps

### Gilson / Rainin Models

		OEM #
26-32-01295	Deuterium Lamp, Gilson/Rainin 112	
26-32-03671	Deuterium Lamp, Gilson/Rainin 115, 116, 117, 118, 119, 151, 152, 155, 156	100326
26-32-03069	Deuterium Lamp, Gilson/Rainin 170 DAD	2140-0590

### Varian Models

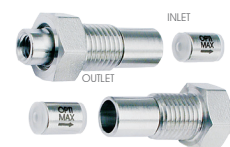
		OEM #
38-32-01637	Deuterium Lamp, Varian 2050, 2550, 5500	
38-32-03673	Deuterium Lamp, Varian Prostar 330 DAD	0393570502
38-32-02831	DoubleLife™ Deuterium Lamp, Vista 5000-5500, UV-50, -100, -200, -9050	0391615691
38-32-02081	Deuterium Lamp, Varian Prostar 340, 345, U-VC, UV-DII, UV-M, UVDII, UV	R000088515
38-32-03654	Deuterium Lamp, Varian Prostar 325, 335	
38-32-04022	Xenon Lamp, Varian Prostar 363	392613102

## opti-max<sup>®</sup> check valves

2690, 2695, 2790, 2795, Alliance\* 

		OEM #
39-46-01949	OPTI-MAX Inlet Housing & Cartridge	WAT027112, 700002332
10-46-02004	OPTI-MAX Replacement Cartridges, 1/16" Ball, 2/Pk	WAT270941, 700002761

\*2690/Alliance Systems have inlet check valves only - outlets are not required.



2690/Alliance

## 100 µL Head Systems

(M45/45G, M501, 510, 515, 590, 600/600E, 610, 6K/6KA, 1515, 1525)

		OEM #
39-56-01251	OPTI-MAX Inlet Housing & Cartridge	WAT033679, 700000253
39-56-01256	OPTI-MAX Outlet Housing & Cartridge	700000253
10-56-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk	700000254, 700002399



100 µL Head Systems

## 225 µL Head (#3) Systems

(510, 515, 590, 600/600E, 610, 650, 6K/6KA)

		OEM #
39-66-01262	OPTI-MAX Inlet Housing & Cartridge	WAT033679, WAT060307
10-66-02005	OPTI-MAX Replacement Cartridges, 3/16" Ball, 2/Pk	
39-56-01256	OPTI-MAX Outlet Housing & Cartridge	WAT025216
10-56-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk	700000254, 700002399



225 µL Head Systems

## 400 µL (#4), 500 µL (#5), & 900 µL (#6) Heads

(Delta Prep 3000, 600/600E, 650)

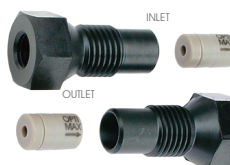
		OEM #
39-66-01267	OPTI-MAX Outlet Housing & Cartridge	WAT033326 WAT033325
10-66-02005	OPTI-MAX Replacement Cartridges, 3/16" Ball, 2/Pk	



400 µL, 500 µL & 900 µL  
Heads/Systems

## 625/626

		OEM #
39-48-01907	OPTI-MAX Inlet Housing & Cartridge, PEEK	WAT030541
39-48-01909	OPTI-MAX Outlet Housing & Cartridge, PEEK	WAT030543
10-48-02004	OPTI-MAX Replacement Cartridges, 1/16" Ball, 2/Pk	WAT024120

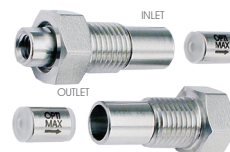


625/626

## 616, 1525 µ (Micro)

		OEM #
39-46-01949	OPTI-MAX Inlet Housing & Cartridge	WAT055845
39-46-01950	OPTI-MAX Outlet Housing & Cartridge	WAT055845
10-46-02004	OPTI-MAX Replacement Cartridges, 1/16" Ball, 2/Pk	WAT270941, 700002761

OPTIONS: Stainless Steel/Ceramic OPTI-MAX cartridges are listed above (except for the 625/626, which requires PEEK housings and cartridges). For other options, please see page 45.



616

## waters (continued)



## seals &amp; pistons

Alliance/2690, 2695, 2790, 2795

OEM #

39-36-02596	OPTI-SEAL UHMW-PE* Piston Seal	WAT270938
39-36-02603	OPTI-SEAL UHMW-PE* Piston Seal, 2/Pk	WAT270938
39-36-02597	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
39-36-02855	Face Seals Replacement Kit, 4/Pk	WAT270939
39-36-02856	Seal Wash Face Seal	WAT271017
39-36-02858	Seal Wash Tube Seals Replacement Kit, 4/Pk	WAT270940
39-36-02860	Seal Wash, Piston Seal, Replacement Kit, 2/Pk	WAT271018
39-34-02180	Sapphire Piston	WAT270959

## 100 µL Head Systems

(M45/45G, M501, 510, 590, 600/600E, 610, 6K/6KA, 1515, 1525, 515)

OEM #

39-36-01305	OPTI-SEAL UHMW-PE* Piston Seal	WAT022934/ WAT022946
39-36-01306	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
39-36-01206	ITB PTFE** Piston Seal, Black	WAT026613
39-36-01207	ITB PTFE** Piston Seal, Black, 10/Pk	
39-36-01208	ITB PTFE** Piston Seal, Red	WAT025638
39-36-01210	ITB PTFE** Piston Seal, Red, 10/Pk	
39-36-01211	ITB PTFE** Piston Seal, Tan	WAT025384
39-36-01213	ITB PTFE** Piston Seal, Tan, 10/Pk	
39-34-01188	Piston, 510, 590, 600/600E, 610, 6K/6KA	WAT025656
39-34-01191	Piston, M45/45G, M501	WAT026524
39-34-01195	Piston Indicator Rod & Spring Kit, 2/Pk	WAT069583
39-34-03522	Sapphire Piston, 1515, 1525, 515	WAS207069

225 µL Head (#3) Extended Flow Systems  
(510, 590, 600/600E, 610, 650, 6K/6KA)

OEM #

39-36-01216	OPTI-SEAL UHMW-PE* Piston Seal	WAT026644
39-36-01217	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
39-36-01214	ITB PTFE** Piston Seal	WAT026644
39-36-01215	ITB PTFE** Piston Seal, 10/Pk	
39-34-01193	Piston	WAT060304

## 616, 625/626

OEM #

39-36-02124	OPTI-SEAL UHMW-PE* Piston Seal	
39-36-02228	OPTI-SEAL UHMW-PE* Piston Seal, 10/Pk	
39-36-02127	ITB PTFE** Piston Seal	WAT031790
39-36-02229	ITB PTFE** Piston Seal, 10/Pk	
39-34-01930	Piston and Spring	WAT031788

\*UHMW PE - Ultra High Molecular Weight Polyethylene

\*\*ITB PTFE - Improved PTFE Blend

## lamps

### Waters

		OEM #
39-32-01175	Mercury Lamp, Waters 440, 441	WAT097323
39-32-01178	Quartz Lamp, Waters 150C	WAT075631
39-32-01179	Deuterium Lamp, Waters 484	WAT080357
39-32-01294	Deuterium Lamp, Waters 450	WAT098946
39-32-01295	Deuterium Lamp, Waters 480, 481, 481AZ	WAT099499
39-32-02823	Deuterium Lamp, Waters 486	WAT080678
39-32-02825	Deuterium Lamp, Waters 2487, 2488, Alliance	WAS081142
39-32-02835	DoubleLife™ Deuterium Lamp, Waters 996, 2996, PDA	WAT052586
39-32-02688	Xenon Lamp, Waters 490E	WAT046660
39-32-02185	Deuterium Lamp, Waters 996, 2996, PDA	WAT057760



Waters  
39-32-02825



Waters  
39-32-02835



39-04-03524  
Filter Insert Assembly



10-04-03151  
Solvent Filter

## filtration

2690/2695, 2790/2795, 600

		OEM #
39-04-03524	2 µm Filter Insert Assembly - In-Line	WAT088084
10-04-03151	Solvent Filter, 1/8", 10 µL, 4/Pk	WAT025531

For additional filtration configurations, see page 31.

## inlet manifold parts & priming accessories

Part No	Description	OEM #
39-31-01293	Threaded Seal Insert, M45/M45G, M501, 510, 590, 600/600E, 610, 6KA	WAT060015 WAT005098
39-31-01171	Optimize Safety Syringe (for pump priming)	WAT027629
39-31-01147	Needle with Nut & Ferrule	WAT025559
39-31-01151	Priming Syringe Kit  <b>Includes:</b> Priming Syringe Needle Nut & Ferrule	



Ball Plug



Threaded Seal Insert



Ruby Ball



Actuator Seat



Needle with /Nut & Ferrule



Priming Syringe

Rebuild your Waters WISP™ Autosampler with these rebuild kits and individual components.



WISP Syringe

waters WISP™ autosampler

Rebuild Kits for WISP Autosamplers

- 39-30-01132

715/717 Seal Pack Assembly Rebuild Kit
- Includes:
- 39-30-01106

Needle Wash Frit (4)
- 39-30-01114

PTFE Washer (1)
- 39-30-01115

Upper Wash Spacer (2)
- 39-30-01119

Gasket (4)
- 39-30-01125

WISP™ Solvent Seal, long (2)

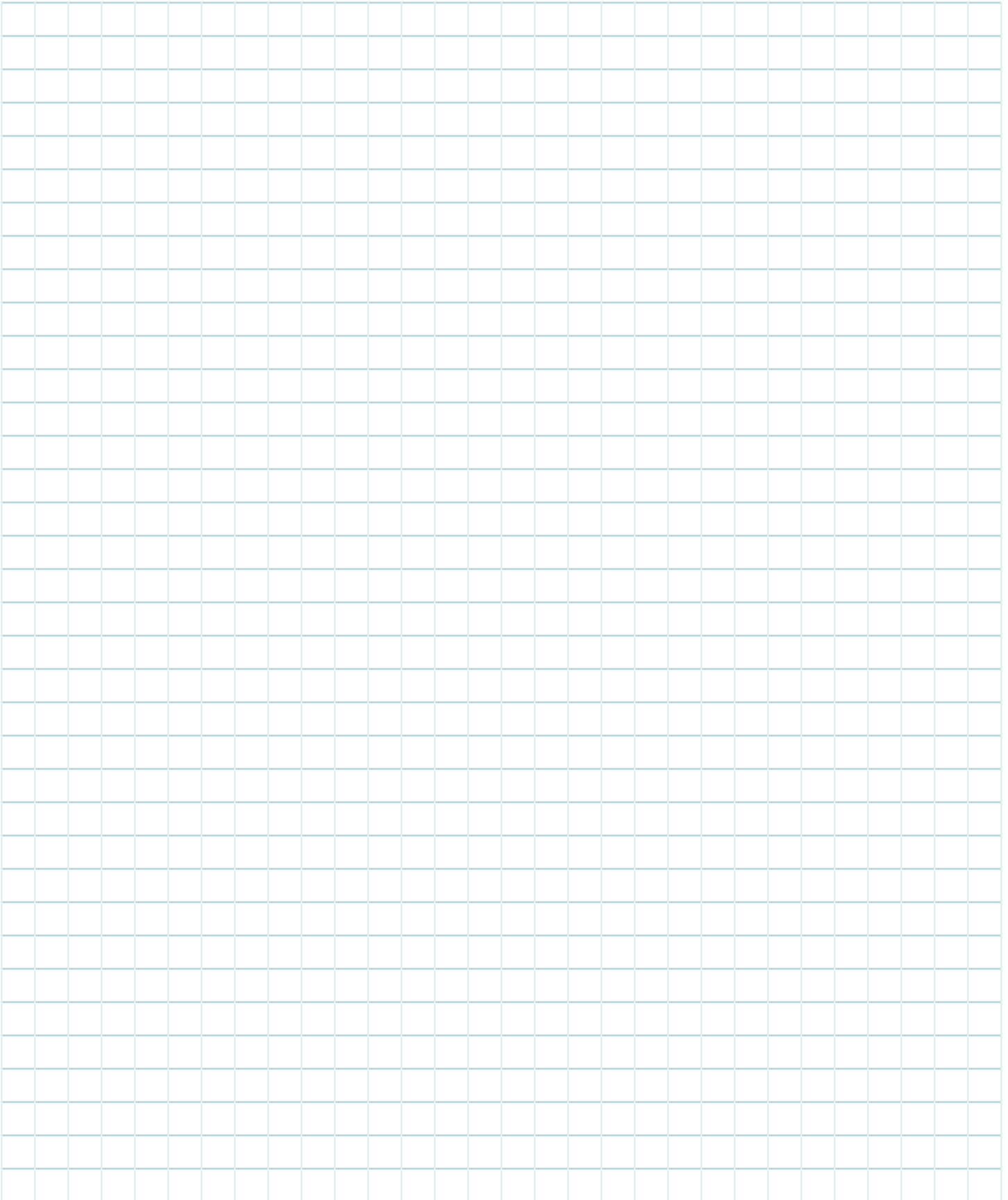
Replacement Components for WISP Autosamplers		OEM #
39-30-01093	250 µL WISP Syringe	WAT073109
39-30-01106	Injector Wash Frit	WAT005106
39-30-01114	PTFE Washer	WAT005135
39-30-01115	Upper Needle Wash Spacer	WAT005133
39-30-01125	WISP Solvent Seal, Long	



Team with **Optimize** to bring your concepts to reality

We look forward to helping you **optimize** your laboratory

Use this space to take notes, sketch an idea or design new components for your instruments.



We believe the best way to predict the **future** is to **invent it**.

## back pressure regulators

Optimize flow-through back pressure regulators utilize an active mechanism to maintain steady back pressure across a range of mobile phase viscosities and flow rates. Placing one downstream from your detector will prevent solvent decompression and bubble formation in the flow cell, reducing baseline noise and drift.

Each regulator has an internal volume of 100  $\mu\text{L}$  and is available in pre-set pressures of 10, 30, 60, 100, or 150 psi.

Place a back pressure regulator downstream from your detector to prevent solvent outgassing and bubble formation in the flow cell, reducing baseline noise and drift.

### Back Pressure Regulators (Fittings Included)

10-06-00120	Back Pressure Regulator, 10 psi
10-06-00128	Back Pressure Regulator, 30 psi
10-06-00129	Back Pressure Regulator, 60 psi
10-06-00130	Back Pressure Regulator, 100 psi
10-06-00132	Back Pressure Regulator, 150 psi



# opti-lok™

fittings, tubing & adapters



As complex and advanced as HPLC systems have become, they still need conduits for fluid transfer: tubing, fittings, and adapters. Though these components are simple in design and, with the advent of finger tight fittings, fairly easy to use, their role in the plumbing of an HPLC system is often overlooked until something goes wrong. Anyone who has ever used an HPLC instrument knows the troubles a faulty or failing fitting can cause.

We realize that your time is valuable and should not be wasted worrying about fittings. For this reason, **all Optimize fittings are precision machined in the USA** for optimal quality and thread consistency. The machining process is the best way to ensure tight manufacturing tolerances and minimal product variance.

What does all this mean? It means that every fitting you purchase from Optimize will perform just as well as the last, so you'll have no worries about faulty fittings. This reflects our commitment to providing our customers with the highest quality, best-designed product available.

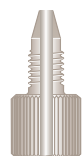
If you have questions about the machining process and how it differs from injection molding, give us a call. We are always eager to share our fabrication process and unyielding dedication to excellence.



# opti-lok™ high pressure fittings

Opti-Lok™ fittings are ideal for making high-pressure connections with 1/16" OD tubing. All Optimize fittings are precision machined for optimal quality and thread consistency, and are designed for trouble-free operation at pressures of up to 6,000 psi.

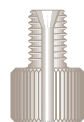
Looking for UHPLC Fittings? See page 11.



OPTI-LOK I  
(PEEK)

## OPTI-LOK I 10-32 Hand-Tight Fittings with Integral Ferrule

Singles	10-20-00258	10 Pack	10-20-00259	OPTI-LOK I, PCTFE
	10-20-00264		10-20-00265	OPTI-LOK I, PEEK



6K Knurled  
Head (PEEK)

## OPTI-LOK 6K 10-32 Nuts & Ferrules

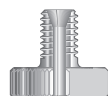
Singles, Nut Only	10-20-00268	10 Pack, with Ferrules	10-20-00270	Knurled Head, PEEK
	10-20-00271		10-20-00272	Hex Head, Short, PEEK
	10-20-00275		10-20-00276	Hex Head, Long, PEEK
	10-20-00273		10-20-00274	Knurled Head, w/wrench-flat, SS
	10-20-00269		10-20-00518	Double Tight Ferrule, PEEK



6K Hex Head,  
Short (PEEK)

## 10-32 Couplers with 1/16" OD x .006" ID x 6cm SS Tubing

10-20-00263	Coupler, PCTFE
10-20-00266	Coupler, PEEK



6K Knurled  
Head (SS)

## Universal 10-32 Nuts & Ferrules for 1/16" OD Tubing

10-24-00367	Universal Nut, SS
10-24-00376	Universal SS Nuts with SS Ferrules, 10/Pk
10-24-00369	Universal Ferrule, SS
10-24-00370	Universal Ferrule, PEEK



Ferrule  
(PEEK)



Double  
Tight  
Ferrule  
(PEEK)

## 10-32 Unions for 1/16" OD Tubing

10-20-00261	PEEK Union, .010" Thru
10-20-00262	PEEK Union, .020" Thru
10-24-00375	Universal Union, with Nuts & Ferrules, .010" Thru, SS
10-24-00373	Universal Union, with Nuts & Ferrules, .020" Thru, SS
10-24-00371	Universal Union, with Nuts & Ferrules, .030" Thru, SS



Universal  
Nut (SS)



Union (PEEK)

## 10-32 Tees for 1/16" OD Tubing

10-20-00287	Tee, .020" Thru, PEEK
-------------	-----------------------



Tee (PEEK)

## 10-32 OPTI-LOK Plugs

Singles	10-20-00251	10 Pack	10-20-00253	Plug, White Acetal
	10-20-00255		10-20-00256	Plug, PEEK

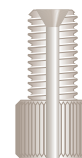


Plug (White Acetal)

Opti-Lok™ LP Fittings are an excellent choice for making low-pressure connections into 1/4-28 ports. Connections to flat-bottomed ports can be made using Opti-Lok flat-bottomed ferrules for 1/16" or 1/8" tubing, without the need for pre-flanged tubing ends. Opti-Lok LP fittings are precision machined to deliver leak-free, zero-dead-volume connections every time. We also offer 1/4-28 unions in various through-hole sizes for joining flat-bottom fittings together.

## OPTI-LOK LP 1/4-28 Nuts & Ferrules for 1/16" OD Tubing

10-21-00290	Nut, PEEK	10-21-00293	Nut, White Acetal
10-21-00292	Nut, ETFE	10-21-00299	Nut, (PTFE)
10-21-00291	Nut, Long, PEEK	10-21-00296	Ferrule, PEEK
10-21-00295	Ferrule, ETFE	10-21-00300	Ferrule, (PTFE)



Nut (PEEK)



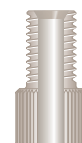
Ferrule (PEEK)

## OPTI-LOK LP 1/4-28 Nuts & Ferrules for .100" OD Tubing

10-21-00283	Nut, White Acetal	10-21-00284	Nut, PEEK
10-21-00281	Ferrule, ETFE		

## OPTI-LOK LP 1/4-28 Nuts & Ferrules for 1/8" OD Tubing

10-21-00307	Nut, PEEK	10-21-00305	Nut, Black Acetal
10-21-00310	Nut, White Acetal	10-21-00306	Nut, PCTFE
10-21-00309	Nut, ETFE	10-21-00317	Nut, (PTFE)
10-21-00308	Nut, long, PEEK	10-21-00313	Ferrule, PEEK
10-21-00312	Ferrule, ETFE	10-21-00318	Ferrule, (PTFE)



Nut (PEEK)

## 1/4-28 Unions

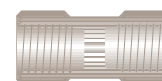
10-21-00322	Union, Polypropylene	10-21-00323	Union, Natural PEEK
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Union (PEEK)

## 1/4-28 Peek Unions, Knurled with Wrench Flats

10-21-00341	Union, .010" Thru, PEEK	10-21-00342	Union, .020" Thru, PEEK
10-21-00343	Union, .050" Thru, PEEK		



Union (PEEK)

## 1/4-28 Tees for 1/16" OD Tubing

10-20-00286	Tee, .062" Thru, PEEK		
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## OPTI-LOK LP 1/4-28 Plugs

10-21-01292	Plug, White Acetal	10-21-00326	Plug, (PTFE)
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Plug (white Acetal)

# opti-lok™ | m6 metric nuts & ferrules

## OPTI-LOK 6K PEEK Metric Fittings for 1/16" OD Tubing

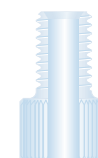
10-22-00328	Nut, Knurled Head w/Hex, PEEK	10-20-00269	Double Tight Ferrule, PEEK
10-22-00329	Nut, Knurled Head w/Hex & Ferrules, 10/Pk		



Double Tight Ferrule (PEEK)

## OPTI-LOK LP Metric Fittings for 1/16" OD Tubing

10-22-00297	Nut, White Acetal	10-22-00301	Ferrule, Short, ETFE
10-22-00303	Ferrule, PPS		



Nut (White Acetal)



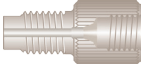
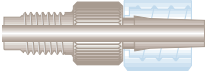
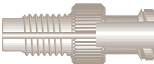
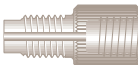
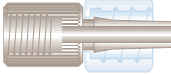
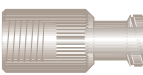

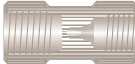
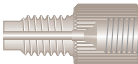

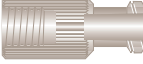
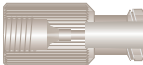
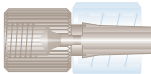
Ferrule (PPS)

## OPTI-LOK LP Metric Fittings for 1/8" OD Tubing

10-22-00314	Nut, White Acetal	10-22-00315	Nut, Black Acetal
10-22-00319	Ferrule, Short, ETFE		

# opti-lok™ adapters

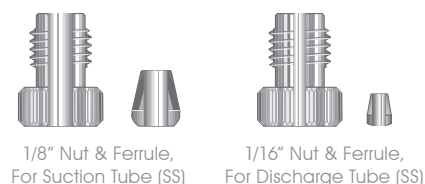
Opti-Lok™ Adapters offer maximum flexibility for making connections between your 1/4-28, M6 (Metric), Luer and 10-32 fittings and ports. They are available in a useful variety of thread-type combinations, all precision machined from PEEK.

	Part Number	Description		Adapter
1/4-28 TO 10-32	10-23-00350	1/4-28 Male	10-32 Parker Female	
1/4-28 TO LUER	10-23-00352	1/4-28 Male	Luer Male	
	10-23-00353	1/4-28 Male	Luer Female	
1/4-28 TO M6	10-23-00351	1/4-28 Male	M6 (Metric) Female	
1/4-28 TO LUER	10-23-00347	1/4-28 Female	Luer Male	
	10-23-00349	1/4-28 Female	Luer Female	
1/4-28 TO M6	10-23-00346	1/4-28 Female	M6 Female, (with Web)	
1/4-28 TO 10-32	10-23-00335	1/4-28 Female	10-32 Parker Female	
M6 TO 10-32	10-23-00357	M6 (Metric) Male	10-32 Parker Female	
	10-23-00355	M6 (Metric) Female	10-32 Parker Female	
M6 TO LUER	10-23-00363	M6 (Metric) Female	Luer Female	
LUER TO 10-32	10-23-00358	10-32 Parker Female	Luer Female	
	10-23-00359	10-32 Parker Female	Luer Male	

# oem specific fittings

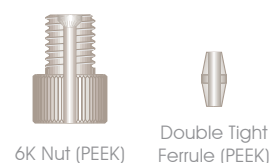
## LDC-Style 5/16-24 Fittings

31-24-00735	1/8" Nut & Ferrule for Suction Tube, SS
31-24-00736	1/16" Nut & Ferrule for Discharge Tube, SS



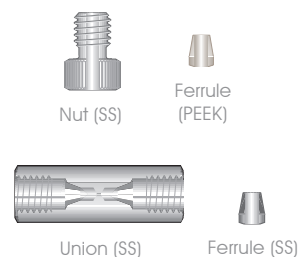
## SSI-Style 1/4-28 Fittings for 1/16" OD Tubing

10-20-00330	6K Nut, PEEK
10-20-00331	6K Nut & Ferrules, PEEK, 10/Pk
10-20-00269	Double Tight Ferrule, PEEK



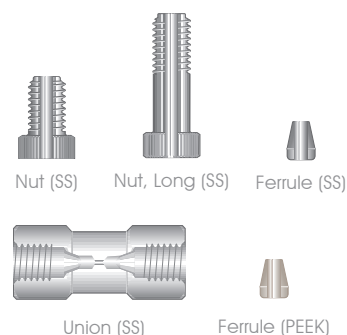
## Parker-Style 10-32 Fittings for 1/16" OD Tubing

40-24-01275	Nut, SS
40-24-01276	Nuts & Ferrules, SS, 10/Pk
40-24-01291	Ferrule, SS
40-24-01290	Ferrule, PEEK
40-24-01271	Union with Nuts & Ferrules, SS, .010" Thru
40-24-01273	Union with Nuts & Ferrules, SS, .020" Thru



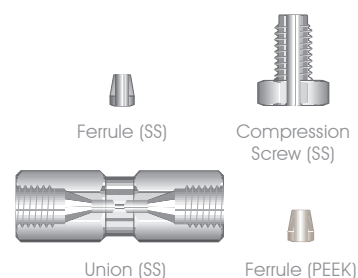
## Genuine Valco 10-32 Fittings for 1/16" OD Tubing

41-24-01277	Nut, SS
41-24-01281	Nuts & Ferrules, SS, 10/Pk
41-24-01278	Nut, Long, SS
41-24-01279	Ferrule, SS
41-24-01283	Union with Nuts & Ferrules, SS, .010" Thru
41-24-01280	Union with Nuts & Ferrules, SS, .030" Thru
41-24-01282	Ferrule, PEEK



## Waters-Style 10-32 Fittings for 1/16" OD Tubing

		OEM #
39-24-01090	Compression Screw, SS	WAT005070
39-24-01091	Compression Screws & Ferrules, SS, 10/Pk	WAT025604
39-24-01291	Ferrule, SS, single	WAT005063
39-24-01290	Ferrule, PEEK	WAT021817
39-24-01088	Union w/ Nuts & Ferrules, SS	WAT097332





3/16" OD  
PTFE

1/8" OD  
PTFE

.100" OD  
PTFE

1/16" OD  
PTFE

1/8" OD  
ETFE

1/16" OD  
ETFE

## tubing

### (ptfe) tubing

#### 1/16" Outside Diameter PTFE Tubing

10-15-00214	1/16" OD x .010" ID x 10 ft
10-15-00215	1/16" OD x .010" ID x 50 ft
10-15-00220	1/16" OD x .020" ID x 10 ft
10-15-00221	1/16" OD x .020" ID x 50 ft
10-15-00226	1/16" OD x .030" ID x 10 ft
10-15-00227	1/16" OD x .030" ID x 50 ft
10-15-00232	1/16" OD x .040" ID x 10 ft
10-15-00233	1/16" OD x .040" ID x 50 ft

#### .100" Outside Diameter PTFE Tubing

10-15-00205	.100" OD x .040" ID x 10 ft
10-15-00206	.100" OD x .040" ID x 50 ft

#### 1/8" Outside Diameter PTFE Tubing

10-15-00238	1/8" OD x .062" ID x 10 ft
10-15-00240	1/8" OD x .062" ID x 50 ft

#### 3/16" Outside Diameter PTFE Tubing

10-15-00243	3/16" OD x .125" ID x 10 ft
10-15-00245	3/16" OD x .125" ID x 50 ft

### (etfe) tubing

#### 1/16" Outside Diameter ETFE Tubing

10-14-00193	1/16" OD x .010" ID x 10 ft
10-14-00194	1/16" OD x .010" ID x 50 ft
10-14-00196	1/16" OD x .020" ID x 10 ft
10-14-00197	1/16" OD x .020" ID x 50 ft
10-14-00199	1/16" OD x .030" ID x 10 ft
10-14-00200	1/16" OD x .030" ID x 50 ft

#### 1/8" Outside Diameter ETFE Tubing

10-14-00202	1/8" OD x .062" ID x 10 ft
10-14-00203	1/8" OD x .062" ID x 50 ft

# tubing

## optipeek® tubing

### 1/16" Outside Diameter PEEK Tubing

10-13-00168	1/16" OD x .006" ID x 10 ft
10-13-00170	1/16" OD x .006" ID x 50 ft
10-13-00175	1/16" OD x .010" ID x 10 ft
10-13-00177	1/16" OD x .010" ID x 50 ft
10-13-00183	1/16" OD x .020" ID x 10 ft
10-13-00186	1/16" OD x .020" ID x 50 ft
10-13-00187	1/16" OD x .030" ID x 10 ft
10-13-00191	1/16" OD x .030" ID x 50 ft
10-13-00179	1/16" OD x .040" ID x 10 ft
10-13-00181	1/16" OD x .040" ID x 50 ft



Plastic  
Tubing  
Cutter

## stainless steel pre-cut tubing

### 1/16" Outside Diameter Stainless Steel Tubing

10-12-00145	1/16" OD x .006" ID x 6 cm
10-12-00143	1/16" OD x .006" ID x 10 cm
10-12-00144	1/16" OD x .006" ID x 20 cm
10-12-00141	1/16" OD x .006" ID x 10 ft
10-12-00151	1/16" OD x .010" ID x 6 cm
10-12-00148	1/16" OD x .010" ID x 10 cm
10-12-00149	1/16" OD x .010" ID x 20 cm
10-12-00150	1/16" OD x .010" ID x 30 cm
10-12-00146	1/16" OD x .010" ID x 10 ft
10-12-00157	1/16" OD x .020" ID x 6 cm
10-12-00154	1/16" OD x .020" ID x 10 cm
10-12-00155	1/16" OD x .020" ID x 20 cm
10-12-00156	1/16" OD x .020" ID x 30 cm
10-12-00152	1/16" OD x .020" ID x 10 ft
10-12-00162	1/16" OD x .030" ID x 6 cm
10-12-00160	1/16" OD x .030" ID x 10 cm
10-12-00161	1/16" OD x .030" ID x 20 cm
10-12-00158	1/16" OD x .030" ID x 10 ft
10-12-00167	1/16" OD x .040" ID x 6 cm
10-12-00165	1/16" OD x .040" ID x 10 cm
10-12-00166	1/16" OD x .040" ID x 20 cm
10-12-00163	1/16" OD x .040" ID x 10 ft



Stainless  
Steel Tube  
Cutter

1/16" OD  
PEEK

1/16" OD  
Stainless  
Steel

## tubing cutters

10-10-00139	Plastic Tubing Cutter
10-10-00140	Stainless Steel Tubing Cutter

Optimize stainless steel tubing is pre-cut and electropolished to ensure square, burr-free ends, and is passivated prior to shipment.

# patents & trademarks

## optimize trademarks

EXP<sup>®</sup>, DX2 DoubleLife<sup>™</sup>, HPLC First Aid Kit<sup>™</sup>, HPLC Switch Kit<sup>™</sup>, HPLC-Finder<sup>™</sup>, ITB<sup>™</sup>, OPTI-DRAW<sup>™</sup>, OPTI-LOK<sup>™</sup>, OPTI-PEEK<sup>™</sup>, OPTI-LYNX<sup>™</sup>, HEAD•LOCK<sup>™</sup>, “At The Speed of Discovery”<sup>™</sup>, OS-10.1<sup>™</sup>, the Optimize Technologies Raindrop Logo, and Free-Turn<sup>®</sup> are trademarks of Optimize Technologies, Inc.

The OPTI<sup>®</sup>- prefix, OPTI-MAX<sup>®</sup>, OPTI-GUARD<sup>®</sup>, OPTI-PAK<sup>®</sup>, OPTI-PRIME<sup>®</sup>, OPTI-SEAL<sup>®</sup>, OPTI-SOLV<sup>®</sup>, Optimize Technologies<sup>®</sup> and Velocity<sup>®</sup> are registered trademarks of Optimize Technologies, Inc.

## optimize patents

EXP<sup>®</sup>: U.S. Pat. No.s 5,525,303; 5,730,943; 5,911,954 and U.S. and foreign patents pending.

OPTI-PRIME<sup>®</sup> Priming Valve: U.S. Pat. No. 5,616,300

OPTI-GUARD<sup>®</sup> 1 mm & 3 mm Guard Columns: U.S. Pat. No.s 5,525,303; 5,730,943; 5,911,954

OPTI-PAK<sup>®</sup> Trap Columns: U.S. Pat. No.s 5,525,303; 5,730,943; 5,911,954

OPTI-LOK<sup>™</sup> Adjustable Adapter: U.S. Pat. No.s 5,525,303; 5,730,943; 5,911,954

OPTI-SOLV<sup>®</sup> Mini Filter: U.S. Pat. No.s 5,525,303; 5,730,943; 5,911,954

OPTI-SOLV<sup>®</sup>: U.S. Pat. No. 3,511,235

HEAD•LOCK<sup>®</sup> Quick-Release Kit for Waters: U.S. Pat. No. 6,000,916

OPTI-LYNX<sup>™</sup>, VELOCITY<sup>®</sup>: U.S. Pat. No.s 6,095,572; 6,361,687

HYBRID FERRULE: U.S. Pat. No. 8,201,854

Other U.S. and foreign patents pending.

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# optimizetechnologies

Please join us in supporting a place for children to heal

## Optimize Technologies supports the Children's Center

A private, non-profit medical assessment center, the Children's Center supports children and families in cases of suspected physical abuse, sexual abuse, neglect, drug endangerment and witness to violence. Specialized evaluations are conducted to confirm and document abuse a child may have suffered, and include a complete medical exam, child forensic interview, treatment planning and family support. The results assure the child's safety, allow professionals to plan appropriate prevention and intervention services and prosecute perpetrators.

### At the Children's Center

- Two-thirds of the children served at the Children's Center are girls and half are younger than seven years old.
- Seventy percent of child abuse assessments provided by the Children's Center are for suspected sexual assault of children.
- The Children's Center provides child abuse assessments for approximately 300 children every year and must turn away others due to limited capacity.

### How You Can Help

Child abuse takes a toll on a child's physical, mental and emotional development. The Children's Center is committed to reducing the incidence and impact of child abuse. Please take a moment to learn more about the Children's Center at [www.childrenscenter.cc](http://www.childrenscenter.cc).

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