TTAB

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

Optimize Technologies, Inc., Opposer, v. Wicom GmbH, Applicant.	Opposition No. 91156666

OPPOSER'S NOTICE OF RELIANCE PURSUANT TO RULE 2.122(d)(2) and 2.122(e)

Opposer, by its attorney, hereby submits this Notice of Reliance pursuant to Rule 2.122(d)(2). Specifically, Opposer relies on its pleaded Registration Nos. as follows:

- Registration No. 2,048,831, attached as Exhibit A;
- Registration No. 2,100,804, attached as Exhibit B;
- Registration No. 2,023,739, attached as Exhibit C;
- Registration No. 2,023,740, attached as Exhibit D; and
- Registration No. 2,107,751, attached as Exhibit E.

08-23-2004
U.S. Patent & TMOfc/TM Mail Rcpt Dt. #22

ORIGINAL

Opposer submits herewith certified copies of said registrations, said copies showing both the current status of and current title to the registration.

Opposer, by its attorney, also hereby submits this Notice of Reliance pursuant to Rule 2.122(e). Specifically, Opposer relies on the following printed publication available to the general public in libraries or of general circulation among members of the public or that segment of the public that is relevant under the issues in this proceeding:

- OPTIMIZE TECHNOLOGIES Finest Liquid Chromatography & Fluid Handling Components 1997-1998 (attached as Exhibit F).

The printed publication is relevant to show that analytical devices and systems for use in the chemical and physical analysis of solid, liquid and gaseous compounds and mixtures

CHRISTENSEN O'CONNOR JOHNSON KINDNESS[PLLC]
LAW OFFICES
1420 Fifth Avenue, Suite 2800
Seattle, WA 98101-2347
TELEPHONE: 206.682.8100

and structural and replacement parts of the type identified by Applicant's application are promoted to identical classes of consumers.

Dated this 20th day of August, 2004.

CHRISTENSEN O'CONNOR
JOHNSON KINDNESS PLLC

Everett E. Fruehling
Steven P. Fricke
Attorneys for Opposer Optimize Technologies, Inc.

CERTIFICATE OF MAILING

I hereby certify that this OPPOSER'S NOTICE OF RELIANCE PURSUANT TO RULE 2.122(d)(2) AND 2.122(e) is being deposited with the U.S. Postal Service in a sealed envelope as first class mail with postage thereon fully prepaid and addressed to the Commissioner for Trademarks, Trademark Trial and Appeal Board, 2900 Crystal Drive, Arlington, VA 22202-3514, on the below date.

Date: August 20, 2004

CERTIFICATE OF SERVICE

I hereby certify that on the 20th day of August, 2004, a true copy of the foregoing OPPOSER'S NOTICE OF RELIANCE PURSUANT TO RULE 2.122(d)(2) AND 2.122(e) was served on counsel for Applicant via first-class mail to:

Stanley C. Macel, III, Esq.
Connolly Bove Lodge & Hutz LLP
1007 North Orange Street
Wilmington, DE 19899
Facsimile No. 302.658.5614

Executed on: Aug 20, 2004

CHRISTENSEN O'CONNOR JOHNSON KINDNESS PLLC
LAW OFFICES
1420 Fifth Avenue, Suite 2800
Seattle, WA 98101-2347
TELEPHONE: 206.682.8100

1212402

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

August 17, 2004

THE ATTACHED U.S. TRADEMARK REGISTRATION *2,048,831* IS CERTIFIED TO BE A TRUE COPY WHICH IS IN FULL FORCE AND EFFECT WITH NOTATIONS OF ALL STATUTORY ACTIONS TAKEN THEREON AS DISCLOSED BY THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE.

REGISTERED FOR A TERM OF *10* YEARS FROM *April 01, 1997*
SECTION 8 & 15
SAID RECORDS SHOW TITLE TO BE IN:
REGISTRANT

By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

M. K. HAWKINS
Certifying Officer

Int. Cl.: 9

Prior U.S. Cls.: 21, 23, 26, 36 and 38

Reg. No. 2,048,831

United States Patent and Trademark Office

Registered Apr. 1, 1997

TRADEMARK
PRINCIPAL REGISTER

OPTI

OPTIMIZE TECHNOLOGIES, INC. (OREGON CORPORATION)
13993 FIR STREET
OREGON CITY, OR 97045

FOR: LIQUID TRANSFER COMPONENTS OF CHEMICAL ANALYSIS EQUIPMENT, NAMELY HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC) - PISTONS AND PLUNGER SEALS FOR PUMPS; SOLVENT RESERVOIR FILTERS; IN-LINE FILTERS; TUBING; CHECK VALVES; PRIME AND PURGE VALVES; PUMP HEADS, PRECOLUMN FILTERS; AND FITTINGS FOR TUBING, IN CLASS 9 (U.S. CLS. 21, 23, 26, 36 AND 38).

FIRST USE 9-15-1985; IN COMMERCE 9-15-1985.

SER. NO. 75-035,122, FILED 12-21-1995.

CONNIE M. JUDGE, EXAMINING ATTORNEY

1212400

THE UNITED STATES OF AMERICA

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UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

August 17, 2004

THE ATTACHED U.S. TRADEMARK REGISTRATION *2,100,804* IS CERTIFIED TO BE A TRUE COPY WHICH IS IN FULL FORCE AND EFFECT WITH NOTATIONS OF ALL STATUTORY ACTIONS TAKEN THEREON AS DISCLOSED BY THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE.

REGISTERED FOR A TERM OF *10* YEARS FROM *September 30, 1997*
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M. K. HAWKINS
Certifying Officer

Int. Cl.: 9

Prior U.S. Cls.: 21, 23, 26, 36 and 38

Reg. No. 2,100,804

United States Patent and Trademark Office

Registered Sep. 30, 1997

TRADEMARK
PRINCIPAL REGISTER

OPTI-GUARD

OPTIMIZE TECHNOLOGIES, INC. (OREGON CORPORATION)
13993 FIR STREET
OREGON CITY, OR 97045

FOR: PRECOLUMN FILTERS AND GUARD COLUMNS FOR HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC), IN CLASS 9 (U.S. CLS. 21, 23, 26, 36 AND 38).
FIRST USE 1-0-1994; IN COMMERCE 1-0-1994.

SER. NO. 75-035,264, FILED 12-21-1995.

CONNIE M. JUDGE, EXAMINING ATTORNEY

1212398

THE UNITED STATES OF AMERICA

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UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

August 17, 2004

THE ATTACHED U.S. TRADEMARK REGISTRATION *2,023,739* IS CERTIFIED TO BE A TRUE COPY WHICH IS IN FULL FORCE AND EFFECT WITH NOTATIONS OF ALL STATUTORY ACTIONS TAKEN THEREON AS DISCLOSED BY THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE.

REGISTERED FOR A TERM OF *10* YEARS FROM *December 17, 1996*
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By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

M. K. HAWKINS
Certifying Officer

Int. Cl.: 9

Prior U.S. Cls.: 21, 23, 26, 36 and 38

Reg. No. 2,023,739

United States Patent and Trademark Office

Registered Dec. 17, 1996

TRADEMARK
PRINCIPAL REGISTER

OPTI-MAX

OPTIMIZE TECHNOLOGIES, INC. (OREGON CORPORATION)
13993 FIR STREET
OREGON CITY, OR 97045

FOR: CHECK VALVES FOR HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC) PUMPS, IN CLASS 9 (U.S. CLS. 21, 23, 26, 36 AND 38).

FIRST USE 0-0-1990; IN COMMERCE 0-0-1990.

SER. NO. 75-035,134, FILED 12-21-1995.

CONNIE M. JUDGE, EXAMINING ATTORNEY

1212392

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

August 18, 2004

THE ATTACHED U.S. TRADEMARK REGISTRATION *2,023,740* IS CERTIFIED TO BE A TRUE COPY WHICH IS IN FULL FORCE AND EFFECT WITH NOTATIONS OF ALL STATUTORY ACTIONS TAKEN THEREON AS DISCLOSED BY THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE.

REGISTERED FOR A TERM OF *10* YEARS FROM *December 17, 1996*

SECTION 8 & 15

SAID RECORDS SHOW TITLE TO BE IN:

REGISTRANT

By Authority of the

COMMISSIONER OF PATENTS AND TRADEMARKS

N. Williams

N. WILLIAMS

Certifying Officer

Int. Cl.: 9

Prior U.S. Cls.: 21, 23, 26, 36 and 38

Reg. No. 2,023,740

United States Patent and Trademark Office

Registered Dec. 17, 1996

TRADEMARK
PRINCIPAL REGISTER

OPTI-SEAL

OPTIMIZE TECHNOLOGIES, INC. (OREGON CORPORATION)
13993 FIR STREET
OREGON CITY, OR 97045

FOR: PISTON AND PLUNGER SEALS FOR HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC) PUMPS, IN CLASS 9 (U.S. CLS. 21, 23, 26, 36 AND 38).

FIRST USE 0-0-1988; IN COMMERCE 0-0-1988.

SER. NO. 75-035,135, FILED 12-21-1995.

CONNIE M. JUDGE, EXAMINING ATTORNEY

1212393

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

August 17, 2004

THE ATTACHED U.S. TRADEMARK REGISTRATION *2,107,751* IS CERTIFIED TO BE A TRUE COPY WHICH IS IN FULL FORCE AND EFFECT WITH NOTATIONS OF ALL STATUTORY ACTIONS TAKEN THEREON AS DISCLOSED BY THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE.

REGISTERED FOR A TERM OF *10* YEARS FROM *October 21, 1997*

SECTION 8 & 15

AMENDMENT/CORRECTION/NEW CERT(SEC7) ISSUED

LESS GOODS

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REGISTRANT

By Authority of the

COMMISSIONER OF PATENTS AND TRADEMARKS

M. K. HAWKINS

Certifying Officer

Int. Cl.: 9
Prior U.S. Cls.: 21, 23, 26, 36 and 38
United States Patent and Trademark Office
Corrected

Reg. No. 2,107,751
Registered Oct. 21, 1997
OG Date Apr. 7, 1998

TRADEMARK
PRINCIPAL REGISTER

OPTIMIZE TECHNOLOGIES

OPTIMIZE TECHNOLOGIES, INC.
(OREGON CORPORATION)
13993 FIRST STREET
OREGON CITY, OR 97045

NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO USE "TECHNOLOGIES", APART FROM THE MARK AS SHOWN.

FOR: LIQUID TRANSFER COMPONENTS OF CHEMICAL ANALYTIC EQUIPMENT, NAMELY, HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC) - TUBING; FITTINGS; PACKED [~~COLUMS~~] • COLUMNS • ; GUARD COLUMNS; PRECOLUMN FILTERS; SEALS; PUMP COMPONENTS. NAMELY, PUMPHEADS, PISTONS, PLUNGERS AND SEALS; CHECK VALVES; PRIMING VALVES; PRIMING ADAPTERS; DETECTOR SOURCE LAMPS; FILTERS; MANIFOLD BALL SEALS; [~~CHECK VALVES, PRIMING VALVES; PRIMING ADAPTERS; DETECTOR SOURCE LAMPS; FILTERS; MANIFOLD BALL SEALS;~~] INJECTOR COMPONENTS, NAMELY, SYRINGES, [~~NEEDLES,~~] SEALS AND NEEDLES; PRESSURE REGULATORS; SAMPLE PROCESSOR COMPONENTS, NAMELY, SYRINGES, NEEDLES, SEALS, WASHERS AND FRITS, ALL FOR HPLC INSTRUMENTS; HPLC MAINTENANCE KITS [~~INCLUDING~~] • COMPRISING • INLET CARTRIDGE CHECK VALVES, OUTLET CARTRIDGE CHECK VALVES, REPLACEMENT CARTRIDGES, PISTONS, PUMP SEALS, FILTERS AND FITTINGS; AND HPLC FITTING KITS COMPRISING TUBING, NUTS AND FERRULES, IN CLASS 9 (U.S. CLS. 21, 23, 26, 36 AND 38).

FIRST USE 10-15-1985; IN COMMERCE 11-1-1985.

SER. NO. 75-035,268, FILED 12-21-1995.

In testimony whereof I have hereunto set my hand and caused the seal of The Patent and Trademark Office to be affixed on Apr. 7, 1998.

COMMISSIONER OF PATENTS AND TRADEMARKS

Int. Cl.: 9

Prior U.S. Cls.: 21, 23, 26, 36, and 38

Reg. No. 2,107,751

United States Patent and Trademark Office

Registered Oct. 21, 1997

TRADEMARK
PRINCIPAL REGISTER

OPTIMIZE TECHNOLOGIES

OPTIMIZE TECHNOLOGIES, INC. (OREGON CORPORATION)
13993 FIRST STREET
OREGON CITY, OR 97045

FOR: LIQUID TRANSFER COMPONENTS OF CHEMICAL ANALYTIC EQUIPMENT, NAMELY HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC) - TUBING; FITTINGS; PACKED ~~COLUMS~~; GUARD COLUMNS; PRECOLUMN FILTERS; SEALS; PUMP COMPONENTS, NAMELY PUMPHEADS, PISTONS, PLUNGERS AND SEALS; CHECK VALVES; PRIMING VALVES; PRIMING ADAPTERS; DETECTOR SOURCE LAMPS; FILTERS; MANIFOLD BALL SEALS; ~~CHECK VALVES, PRIMING VALVES, PRIMING ADAPTERS, DETECTOR SOURCE LAMPS, FILTERS; MANIFOLD BALL SEALS,~~ INJECTOR COMPONENTS, NAMELY SYRINGES, ~~NEEDLES,~~ SEALS AND NEEDLES; PRESSURE REGULATORS; SAMPLE PROCESSOR COMPONENTS, NAMELY SYRINGES, NEEDLES, SEALS, WASHERS AND FRITS, ALL FOR HPLC INSTRUMENTS; HPLC MAINTENANCE KITS ~~INCLUDING~~ INLET CARTRIDGE CHECK VALVES, OUTLET CARTRIDGE CHECK VALVES, REPLACEMENT CARTRIDGES, PISTONS, PUMP SEALS, FILTERS AND FITTINGS; AND HPLC FITTING KITS COMPRISING TUBING, NUTS AND FERRULES, IN CLASS 9 (U.S. CLS. 21, 23, 26, 36 AND 38).

FIRST USE 10-15-1985; IN COMMERCE 11-1-1985.

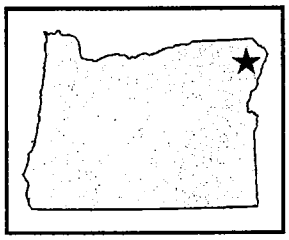
NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO USE "TECHNOLOGIES", APART FROM THE MARK AS SHOWN.

SN 75-035,268, FILED 12-21-1995.

PETER CATALDO, EXAMINING ATTORNEY

OPTIMIZE
TECHNOLOGIES

Finest Liquid Chromatography
&
Fluid Handling
Components
1997-1998



On The Cover:

IMNAHA RIVER CANYON, OREGON

Photograph by Larry N. Olson

Our cover photograph shows the Imnaha River canyon, in Northeastern Oregon. This stunning landscape stretches from the headwaters of the Imnaha River, nestled in the highest peaks of the Wallowa Mountains, down to the bottom of Hells Canyon, where the Imnaha meets the Snake River. The entire run, including the south fork, is protected under the Wild and Scenic Rivers Act, which provides the most comprehensive protection accorded any U.S. River.

This image is included in *Oregon Rivers*, an exhibit-format book to be published by Westcliffe in the Fall of 1997. The book features color photographs by Larry N. Olson, depicting the fifty five wild and scenic rivers in Oregon, complimented with text written by John Daniel, essayist, poet, environmental journalist and winner of the 1993 Oregon Book Award for Creative Nonfiction. The primary focus of *Oregon Rivers* is to raise public awareness about the fragility of Oregon's protected rivers and their ecosystems, and of the need for continued vigilance if they are to be preserved.

Larry N. Olson has been a professional wilderness photographer for over twenty five years. His photographs have been published in *Sierra*, *Wilderness*, *The Nature Conservancy* and *Audubon*. Limited edition photographs, hand-printed by Larry, as well as prepublication copies of *Oregon Rivers*, are available from his studio. For more information, please call (503) 635-5288.

Imnaha River Canyon, Oregon

© Larry N. Olson

OPTIMIZE
TECHNOLOGIES

To Our Valued Customers:

Somewhere out there, working deep inside the basement lab of a pharmaceutical company's head office, are some chromatographers who have never heard of Optimize Technologies. These chemists still do things the old-fashioned way; they painstakingly rebuild check valves, they prime their HPLC pumps with priming valves that are best operated by people blessed with an extra hand, and worst of all they work long, long hours, and sometimes on weekends. These are the same chemists that have racks of samples lined up and ready for analysis, but can't get to them because they have to spend too much of their time on system maintenance; they're busy tweaking plumbing, diagnosing component failures, or waiting for a technician to show up.

When I started Optimize Technologies 12 years ago, I had the chemists in that basement lab in mind; I knew there had to be a better way. At Optimize, we spend every day looking for better ways to bridge the gap between the chemistry and the equipment. Many of our products are born as a result of solving problems brought to us by customers like you. We strive to bring you the best possible value by providing responsive service and innovative products. When you install HPLC components from Optimize, you join a growing number of researchers who have discovered that when it comes to HPLC consumables, precision and quality have a tremendous impact on the performance and reliability of your HPLC system. By using only the best components available, you'll enjoy smoother, more reliable instrument performance between scheduled maintenance periods. That way, you get more time to concentrate on more important things, like your research (and your weekends!)

I once heard a customer describe Optimize as "the best kept secret in the HPLC industry." I think this description fits us very well, but not because we're trying to be clandestine. We don't spend a lot of money on advertising; we'd rather focus on the research and development of new products that will make your lab life easier, and get you home on time at the end of the day. Innovative products like OPTI-GUARD™ Guard Columns and OPTI-MAX® Cartridge Check Valves offer precision-machined solutions that save you time by performing reliably and minimizing problems related to component changeover. Apparently, Optimize is not as much of a secret as it used to be. Optimize components are being incorporated as original equipment on new HPLC systems from several manufacturers, and we've seen strong growth year after year as more and more chromatographers switch their systems to Optimize.

Things have changed a lot at Optimize in 12 years, but our mission remains the same: to design and manufacture the highest quality HPLC components and accessories available, and to stand behind them with responsive customer service and technical support, so that we may earn your business, and your trust. Let us know how we're doing — call us, send e-mail or visit our web page, and challenge us to find solutions to your unique HPLC liquid handling questions.

Thank you for your continued support and patronage.

Sincerely,

Douglas W. Ford

President

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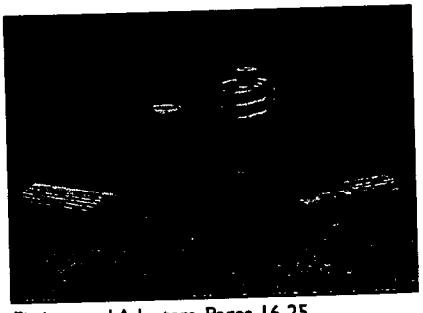

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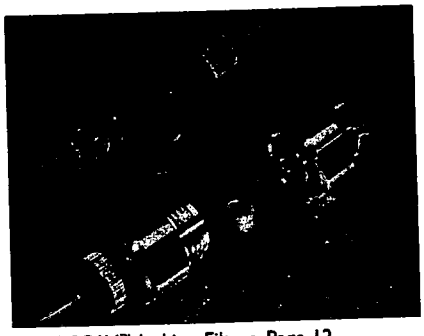

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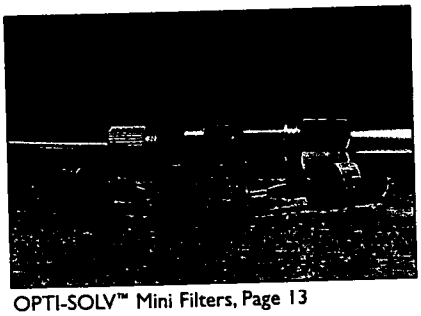

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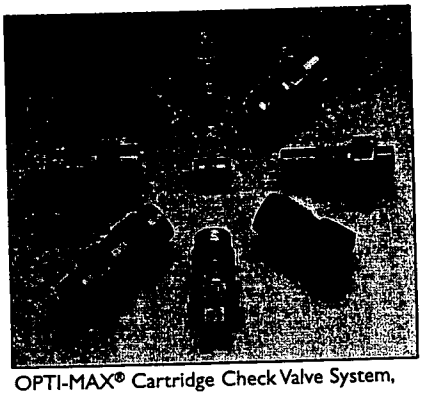

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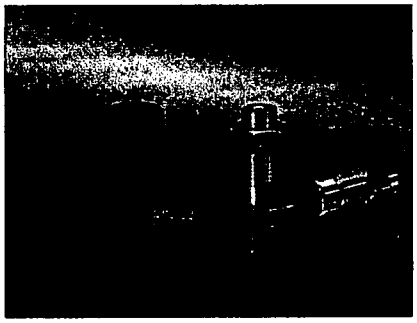

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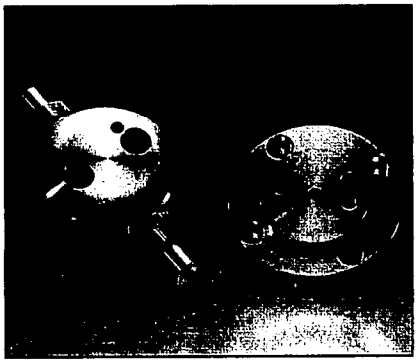


OPTI-PRIME™ Pump Head and Bushing For Waters, Page 99

ABOUT OPTIMIZE

When Doug Ford founded Optimize Technologies, Inc. in 1985, his plan was to build a unique manufacturing company on a simple idea. Over a decade later, this idea is still the heart of our philosophy at Optimize: to offer the most finely made HPLC components available, and to stand behind them with the most responsive and effective customer service in the industry.

Precision and Value By Design

Optimize HPLC components are used around the world by researchers who prefer to spend more time on their chromatography, and less time fixing their instruments. In your laboratory, time is an important factor. Time is fundamental to your chromatography; it is the axis along which mixtures of analytes are resolved. Time is also fundamental to a concept more fiscal than chemical: your bottom line. When an HPLC system is rendered inoperative by a maintenance problem, the opportunity cost of lost analysis time can add up very quickly, and can far exceed the cost of the parts that caused the problem to begin with.

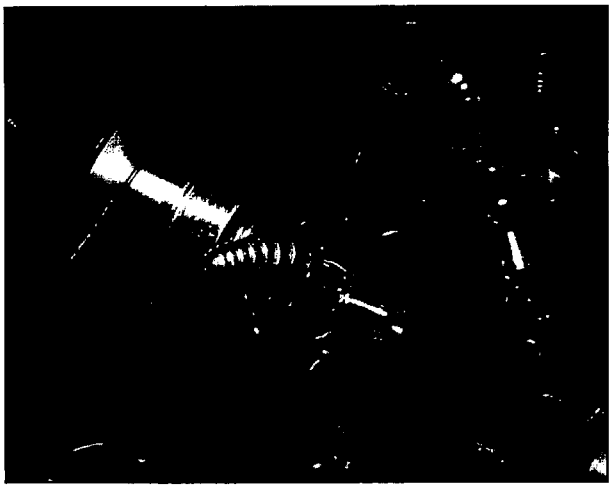
Each year, we hear from more and more scientists who have discovered the benefits of Optimize innovation. When it comes to spare parts, our customers know there is a difference: using HPLC components of superior quality and unsurpassed reliability means less time spent on instrument maintenance, and more time spent on what's really important — your research.

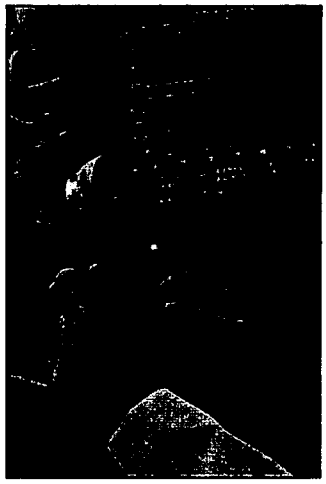
Optimize R&D

At Optimize, we place a high priority on research and development. Our R&D team of engineers and chemists continually develops innovative solutions to fresh analytical challenges. New products are evaluated and thoroughly tested in our laboratory under a variety of operational conditions, to confirm that they meet our exacting standards for performance and reliability. Our goal is to ensure that the components you buy from Optimize work the first time, every time.

Optimize R&D benefits from a unique breadth of experience beyond the HPLC consumables market. We frequently partner with other firms such as pharmaceutical companies and instrument manufacturers to design and develop components and larger assemblies on an OEM basis. Our capacity for innovative design and custom manufacture allows us to engage in very productive and mutually beneficial partnerships with these companies.

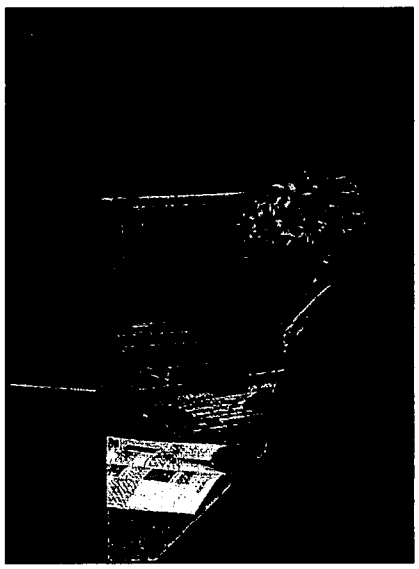
ABOUT OPTIMIZE





Precision Machining

Only by individually machining each component we make can we achieve the tight tolerances, consistent threads and surface finishes that set our products apart. Everything from the smallest PEEK double-tight ferrule to a complete pump head assembly is precision-machined in a state-of-the-art manufacturing environment. Every polymeric fitting, ferrule and cartridge you buy from Optimize will be free of mold lines, thread inconsistencies and other problems associated with mold-based production techniques.



Quality Control: One Part at a Time

From conception to manufacture, our entire product development cycle is geared toward production of the most reliable and well-made components available. Quality control is a vital step in this cycle. Our Statistical Process Control (SPC) system enables us to closely monitor the quality of our manufacturing process. By continual analysis of manufacturing trends while the parts are in process, part-to-part variation can be minimized. When it comes to quality, there are no shortcuts: every part we manufacture is guaranteed to meet the standards of reliability and performance you can always expect from Optimize.

How Can We Help You?

At Optimize, customer service is not a department — it's our business. Our integrated team of engineers, chemists, machinists, quality assurance professionals and technical support specialists work together to answer your tough questions and to help you meet your analytical challenges. Need a part number, a price or a new catalog? Call customer service at 800-669-9015. Have a problem with a particular application, a maintenance question, or need solvent compatibility information? Ask for a technical support specialist. Whether you are an end-user or a purchasing agent, support professionals are ready to help you with informative product advice, and fast order entry.

Optimize also offers HPLC maintenance training seminars both in the U.S. and worldwide. Seminar topics include periodic maintenance and system optimization, and can be individually tailored to audience needs. Call for more details about a seminar near you.

Our Guarantee

HPLC components from Optimize are the highest quality accessories of their type you can buy, and we guarantee it. Each component we make is designed to meet or exceed original equipment specifications, and carries the hallmark of Optimize machining quality. Every Optimize product we sell must meet these criteria, and every product carries our full guarantee of satisfaction.

SOLVENT COMPATIBILITY GUIDE

HPLC components and accessories from Optimize are manufactured using the materials listed in this solvent compatibility chart. Each material earns a solvent compatibility grade of A or B, based on that material's resistance to chemical attack. Grade A materials are completely resistant to common HPLC solvents and reagents, while Grade B materials are susceptible to chemical attack under certain conditions. Specific cautionary information is provided for all grade B materials. For more information on compatibility for a specific solvent, please call our Technical Support Department at 800-669-9015.

SOLVENT COMPATIBILITY CHART

Acetal (Delrin®)	B	Do not use with strong acids, strong bases, or oxidizing agents.
Ceramic	A	
Chemraz®	A	
Hastelloy C®	B	Aqueous acidic chlorides will cause pitting.
Kalrez®	A	
Kel-F® (CTFE)	B	Use caution with THF and halogenated solvents.
Nylon	B	Attacked by strong acids, oxidizing agents, phenols and concentrated solutions of certain salts.
OS-10.1™ (UHMW-PE)	B	Avoid using with strong oxidizing agents.
PEEK (Polyetheretherketone)	B	Avoid hydrophobic acid (20-100%), concentrated sulfuric or nitric acids. Use caution with Dichloroethane & THF.
Perfluor®	A	
Polypropylene (PP)	B	Do not use with strong oxidizing agents.
Ruby	A	
Rulon	[illegible]	
Sapphire	A	
Stainless Steel 316	B	Aqueous acidic chlorides will cause pitting.
Techtron® (PPS)	A	
Teflon® (FEP)	[illegible]	
Teflon® (PTFE)	A	
Tetzel® (ETFE)	A	
Titanium (Ti)	B	Aqueous acidic chlorides will cause pitting.
Viton®	B	Attacked by strong bases and certain organic solvents.

This information is current and to date, and is presented as a general guide to solvent compatibility.
It is presented without any guarantee, liability or warranty of any kind, neither expressed nor implied.

TRADEMARKS

HPLC FIRST AID KIT(S)™, ITB-12™, OPTI-DRAW™, OPTI-GUARD™, OPTI-LOK™, OPTI-PEEK™, OPTI-PRIME™, OPTI-SOLV™, OS-10.1™, Optimize Technologies™, the Optimize Technologies Raindrop Logo, FREE-TURN™ and the Free-Turn Arrow Logo are Trademarks of Optimize Technologies, Inc.

The OPTI®- prefix, OPTI-MAX® and OPTI-SEAL® are Registered Trademarks of Optimize Technologies, Inc.

Patented Optimize Products:

OPTI-GUARD™ 1mm & 3mm Guard Columns	U.S. Pat. No. 5,525,303
OPTI-LOK™ Adjustable Adapter	U.S. Pat. No. 5,525,303
OPTI-SOLV™ Mini Filter	U.S. Pat. No. 5,525,303
OPTI-PRIME™ Priming Valve	U.S. Pat. No. 5,616,300

Kromasil™ is a Trademark of Eka-Nobel.

Rulon™ is a Trademark of Dixon Industries.

Delta Prep™ and WISP™ are Trademarks of Waters Corporation.

IsoChrom™ is a Trademark of Spectra-Physics Analytical, Inc.

Chemraz® is a Registered Trademark of Greene, Tweed & Co.

Delrin®, Kalrez®, Teflon®, Tefzel®, and Viton® are Registered Trademarks of E.I. du Pont de Nemours & Co.

Hastelloy C® is a Registered Trademark of Cabot Corporation.

Kel-F® is a Registered Trademark of the 3M Company.

LaChrom® is a Registered Trademark of the Merck Hitachi Company.

Perfluor® is a Registered Trademark of the Furon Co.

Techtron® is a Registered Trademark of DSM Engineering Plastic Products, Inc.

MS-DOS®, Windows® and Microsoft® are U.S. Registered Trademarks of Microsoft Corporation.

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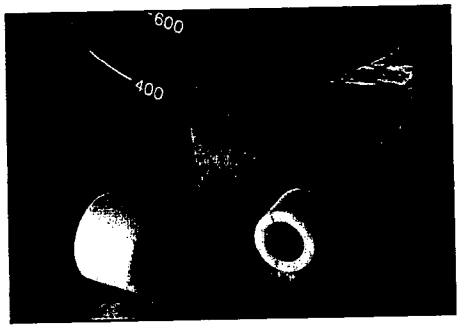
Filtration: A Systematic Approach

Obtaining reliable, consistent results from your HPLC system requires continuous consideration of chemical and mechanical factors that can negatively impact system performance. For your laboratory to remain competitive, instrument down-time must be kept to an absolute minimum. Many common instrument problems are caused by the presence of particulate contamination introduced by the mobile phase or as a by-product of system operation. Particulates can cause a variety of maintenance headaches, including check valve failure, excessive wear of the piston and seal, and high back-pressure due to frit blockage. A consistent, holistic approach to filtration is an effective means of minimizing particulates in your flow path. It is also a vital precaution that will keep your chromatograph working for you (and not the other way around).

Mobile Phase

The first and perhaps easiest place to prevent particulate contamination is in the mobile phase. Buffer salts, improperly cleaned glassware, microbial contamination and inadequate pre-filtering procedures are all potential sources of particulates. Solvent manufacturers adequately filter HPLC-grade solvents prior to bottling; ideally, there should be no need for additional pre-filtering in your laboratory if your mobile phase contains only HPLC-grade solvents. Mobile phases prepared with buffer salts or other solid reagents should be filtered prior to use, however. A 0.2 or 0.45 µm membrane filter is recommended for this filtration step. It is also a good idea to discard the first few milliliters of solvent that pass through the filter.



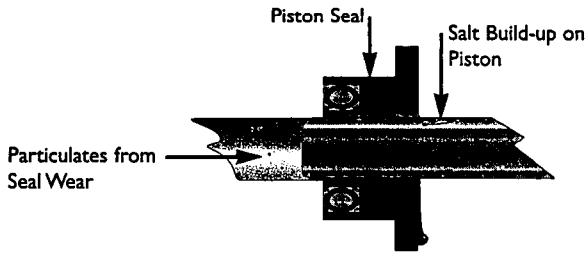
Solvent reservoir filters are a useful filtration accessory, providing a first line of protection as the solvent enters the system. OPTI-SOLV™ Solvent Reservoir Filters (page 14) are an excellent choice for this application; OPTI-SOLV secures your inlet tubing at the bottom of the solvent reservoir without the use of tools or fittings, and is machined from PTFE and Titanium. This well-swept filter ensures access to all but the last few milliliters of solvent, and will not trap bubbles or leach extractable contaminants. Solvent reservoir filters are available with a choice of frit porosities. For analytical HPLC applications, a 2 µm frit is the best choice, while a larger porosity frit such as 10 µm should be selected for flow rates exceeding 10 mL/min.

Piston Seals

Piston seals are a common source of particulate contamination in the flow stream. As the piston moves back and forth through the piston seal at high pressure, seal fragments can slough off from the mating surface of the seal. The size and shape of shed particles will vary depending upon the nature and quality of the material from which the seal is made. These variables are important to consider, as they directly impact the ease with which shedding particles can be removed from the flow path. Particles too small to be trapped by a 2 µm filter, or large enough to be trapped within the frit but below the surface, will cause the most trouble.

The exclusive polymer blends used in our ITB™ and OPTI-SEAL® piston seals are specifically formulated to shed particles large enough to be trapped at the surface of a 2 µm frit. Because particulates in the pump head can cause increased friction and abrasion between the piston and seal, excessive seal wear is both a source and a symptom of particulate contamination.

The build up of precipitated salts and other particulates within the pump can be minimized by regular flushing with non-buffered mobile phase. Some pumps include a piston flushing utility that allows the piston to be rinsed on the low pressure side of the seal while the pump is in use. Daily piston flushing can help prevent salt precipitation on the surface of the piston and can prolong the life of both the piston and piston seal.



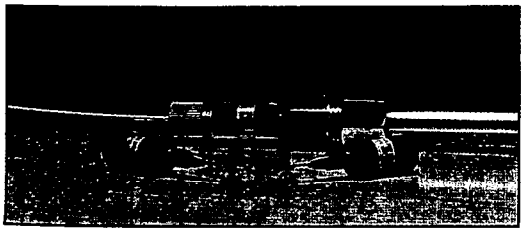
For most effective protection from seal shedding particulates, we recommend the use of an in-line filter installed downstream from the pressure transducer but prior to the injection valve or autosampler. OPTI-SOLV In-Line Filters (page 12) are a convenient and cost-effective solution for most in-line filtering applications, providing rapid access to replaceable frits without requiring disconnection of attached tubing.

Some instrument manufacturers supply check valve assemblies equipped with a filter element on the outlet side. While a filter frit in this location may seem to be a better option than no filter at all, this arrangement can be problematic. First, the use of an in-line filter upstream of the pressure transducer complicates pressure-based diagnosis of instrument performance. Second, placement of a frit this close to the outlet check valve causes particulates to build up in a location where they are likely to cause problems. Check valve failure is often brought on by the adherence of contaminants to the surface of the ball, causing it to stick or seal improperly. In-line filtration of seal debris and other particulates downstream from the pressure transducer will minimize the chance of check valve contamination and will not complicate system diagnostics.

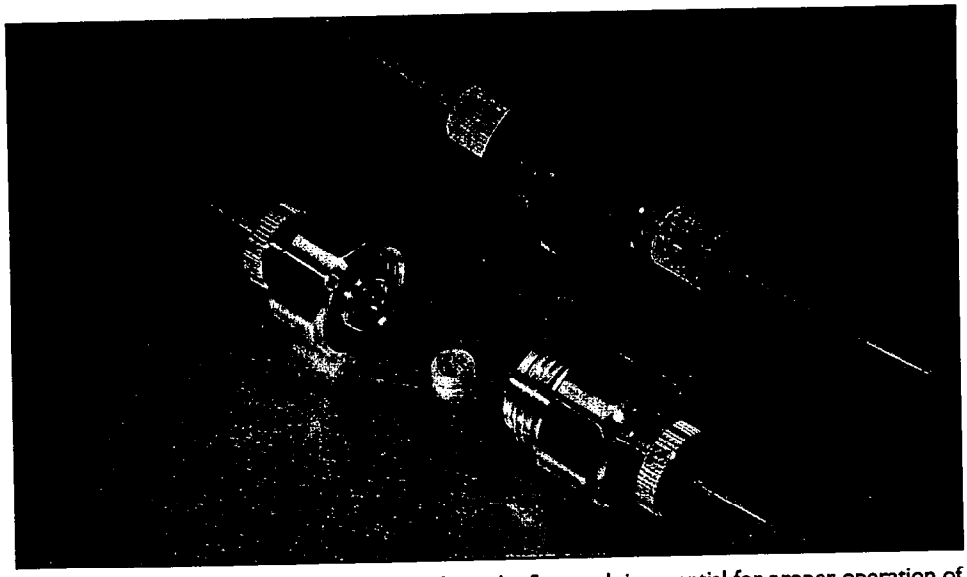
Precolumn Filtration

Two more potential sources of particulate contamination can cause trouble in the region beyond the injection device but before the analytical column. First, the injection device itself can introduce particles resulting from rotor seal wear or the coring of vial septa. Second, contamination may be introduced by the sample matrix. The analytical column can be damaged by irreversibly retained contaminants in the sample matrix, or by salts that precipitate due to incompatibilities between the sample matrix and mobile phase.

Where practical, most of these types of contamination can be addressed in the sample preparation procedure. In cases where additional filtration is required between the injector and column, a low-volume, low-dispersion filter and/or guard column must be employed. OPTI-SOLV Mini Filters (page 13) and OPTI-GUARD™ Guard Columns (pages 32-33) work extremely well for applications requiring precolumn protection. Our patented, automatically adjusting tube stem design assures zero-dead-volume connections and low dispersion in an area where excessive dead volume can literally make or break your assay.



OPTI-SOLV™ IN-LINE FILTER



In HPLC, the removal of particulate matter from the flow path is essential for proper operation of the instrument, and for protection of vital and expensive components. The OPTI-SOLV™ In-Line Solvent Filter was designed to protect your HPLC system from foreign particles, helping you to minimize system down-time and operating costs. An OPTI-SOLV In-Line Filter installed between the pump and injection valve or autosampler can protect these expensive components from seal wear particles and other debris. The OPTI-SOLV features a unique swivel design that allows access to the filter compartment without removal of the connecting tubing; once the tubing and fittings are connected to the stainless steel inserts, there is no need to remove them again. Holders constructed from PEEK are hand-tightened, making frit changes a snap.

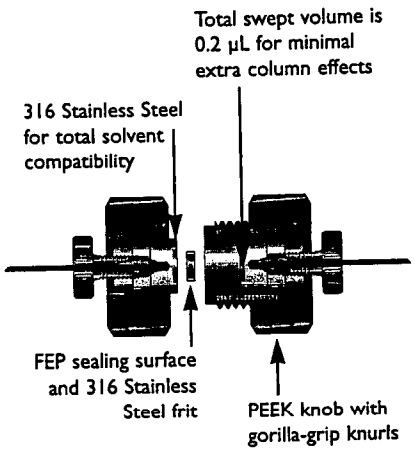
FILTRATION

OPTI-SOLV™ In-Line Solvent Filter

OPTI-Part #	Description	Price
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
10-04-00390	2 µm SS Wrench Tight	[illegible]
10-04-0039[illegible]	2 µm PEEK Hand Tight	[illegible]

All of the above include holder, fittings and 2 filter elements.

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]



FEATURES

- Use with any HPLC system.
- Hand-tight PEEK holder.
- Wrench-tight SS holder.
- Inserts are designed to allow for different filter thicknesses.
- Swivel insert allows tubing to remain connected during filter replacement.

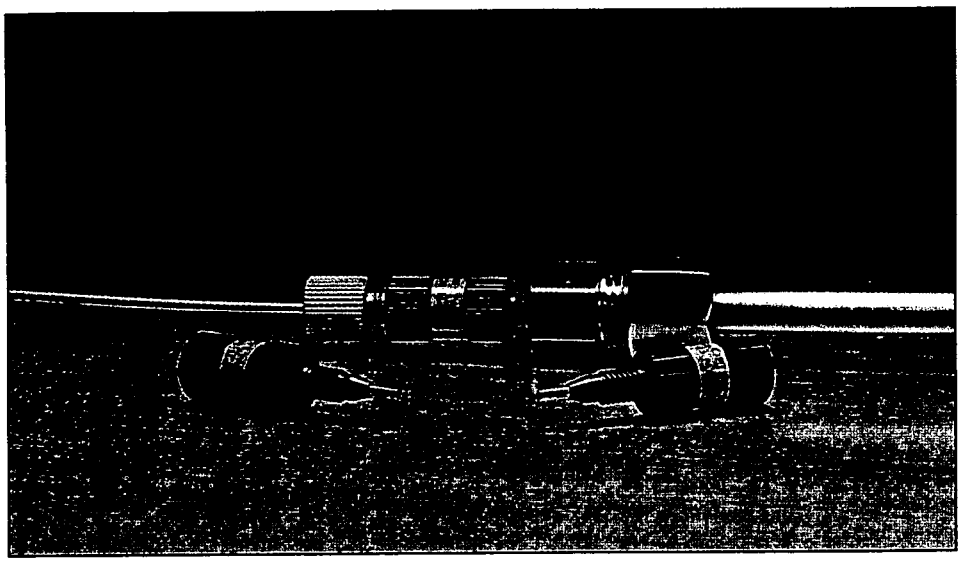
SPECIFICATIONS

- Outside dimensions: 1" diameter x 1 1/4" long.
- 0.10" diameter through-hole, 0.2 µL flow-through volume.
- 10-32 Parker-style female port.
- 6,000 psi pressure rated.
- Available in 0.5 µm and 2 µm porosities.

MATERIALS

- 316 Stainless Steel
- PEEK
- Teflon®

OPTI-SOLV™ MINI FILTER



The OPTI-SOLV™ Mini Filter is a hand-tight, automatically adjustable in-line filter that can extend the life of your analytical column. It can be used anywhere between the pump and detector to catch particulates, or can replace your guard column. Perfect zero-dead-volume connections are obtained every time thanks to our patented automatic tube-stop depth adjustment. Depth filtering elements allow for exceptionally large throughput with no band spreading or loss in performance. OPTI-SOLV is the completely disposable, holder-free solution to your filtering needs.

OPTI-SOLV™ Mini Filter

OPTI-Part #	Description	Color	Price
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

FEATURES

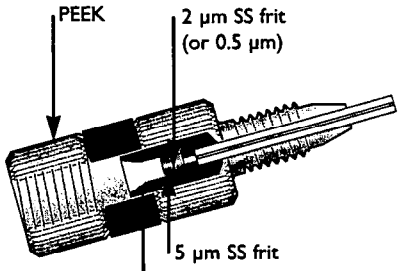
- No holder needed.
- No band spreading.
- Compatible with any 10-32 column.
- Patented 2-piece design automatically adjusts to fit all brands of columns and allows perfect zero-dead-volume connections.
- Completely disposable.
- Depth filtration design.

SPECIFICATIONS

- Overall dimensions: 3/8" diameter x 1" long.
- 0.10" through-hole.
- Less than 1.5 µL internal flow-through volume.
- 6,000 psi pressure rated.
- Compatible with all 10-32 female ports (except Rheodyne injector port).
- Depth Filtration Design.

MATERIALS

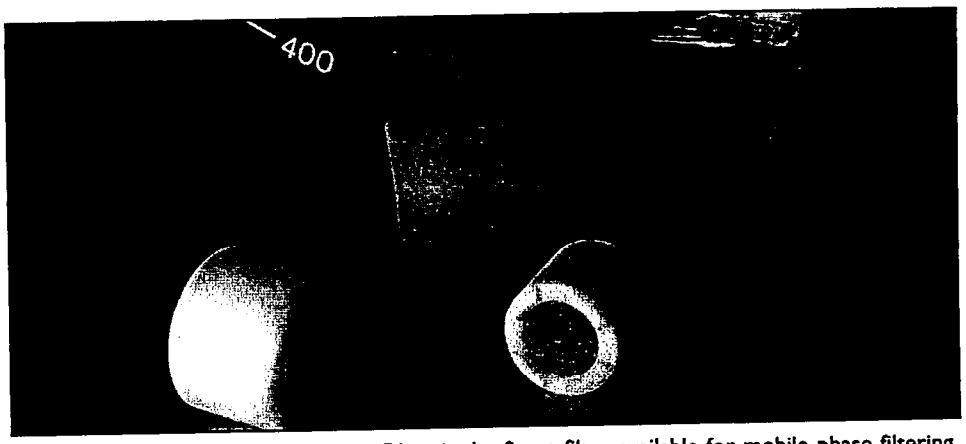
- PEEK
- 316 Stainless Steel



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

FILTRATION

SOLVENT RESERVOIR FILTERS



The OPTI-SOLV™ Solvent Reservoir Filter is the finest filter available for mobile phase filtering. The unique design requires no assembly or fittings for installation, and remains at the bottom of the solvent bottle while allowing unrestricted solvent access. You won't have to force your inlet tubing over a stem — simply insert the tubing into the Teflon® housing until it bottoms out. A unique conical internal flowpath assures that all air is readily purged from the filter and housing.

FEATURES

- Easy to install - requires no tools or fittings.
- Teflon® and Titanium ensure inert environment.
- Purges quickly and completely.
- Offers smooth flow path, preventing trapped bubbles that can cause pump cavitation.
- Cost-efficient, as all mobile phase can be drawn from the solvent reservoir bottle.

SPECIFICATIONS

- 2 and 10 micron analytical and preparatory filters for 1/16", 1/8" and 3/16" OD tubing.
- 1/16" analytical filter fits a 1 liter solvent bottle that has an inside neck diameter of at least 3/4".
- Preparatory filter gives a larger surface area and is intended for all 4 liter solvent bottles with an inside neck diameter of at least 1".
- 10 µm porosity is required when flow rates exceed 10 mL/min. 2 µm filter is for most analytical applications.

MATERIALS

- Teflon
- Titanium frit

OPTI-SOLV™ Solvent Reservoir Filter

Analytical Filters for 1/16" OD Tubing

OPTI-Part #	Description	Price
10-04-00079	2 micron	
10-04-00080	2 micron, 5/Pk	
10-04-00081	10 micron	
10-04-00082	10 micron, 5/Pk	

Analytical Filters for 1/8" OD Tubing

10-04-00047	2 micron	
10-04-00050	2 micron, 5/Pk	
10-04-00051	10 micron	
10-04-00053	10 micron, 5/Pk	

Analytical Filters for 3/16" OD Tubing (Waters Style)

10-04-00054	2 micron	
10-04-00056	2 micron, 5/Pk	
10-04-00057	10 micron	
10-04-00058	10 micron, 5/Pk	

Preparatory Filters for 1/8" OD Tubing

10-04-00059	2 micron	
10-04-00062	2 micron, 5/Pk	
10-04-00063	10 micron	
10-04-00065	10 micron, 5/Pk	

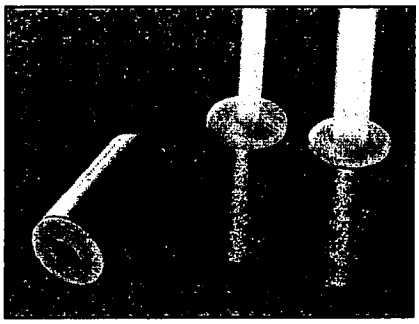
Preparatory Filters for 3/16" OD Tubing (Waters Style)

10-04-00066	2 micron	
10-04-00068	2 micron, 5/Pk	
10-04-00069	10 micron	
10-04-00070	10 micron, 5/Pk	

SOLVENT RESERVOIR FILTERS

We took the convenient design you have come to expect from OPTI-SOLV™ and applied it to traditional solvent reservoir filters. These provide a simple connection with no tube restriction. Insert the tubing into the opening and drop the filter into the solvent reservoir. All filters are made of Hastelloy C® for maximum corrosion resistance and inertness. Each is available for 1/16", 1/8" or 3/16" OD tubing.

Female Solvent Reservoir Filter



For 1/16" OD Tubing

OPTI-Part #	Description	Price
10-04-00075	2 micron	
10-04-00076	2 micron, 5/Pk	
10-04-00077	10 micron	
10-04-00078	10 micron, 5/Pk	

For 1/8" OD Tubing

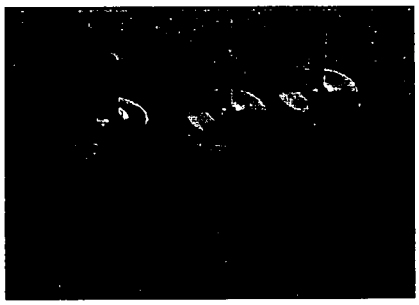
10-04-00037	2 micron
10-04-00039	2 micron, 5/Pk
10-04-00040	10 micron
10-04-00041	10 micron, 5/Pk

For 3/16" OD Tubing (Waters Style)

10-04-00042	2 micron
10-04-00044	2 micron, 5/Pk
10-04-00045	10 micron
10-04-00046	10 micron, 5/Pk

Optimize Solvent Reservoir Filters with tube stem are made of Hastelloy C for maximum corrosion resistance and inertness. The filter with a 1/8" stem is an improved version of the Waters filter, and is directly interchangeable. The filter with a 1/16" stem may be used for most other HPLC systems. For extended flow systems, and where flow rates exceed 10 mL/minute, a 10 micron filter is required. For most analytical applications, the 2 micron filter is preferable.

Solvent Reservoir Filters with Tube Stem



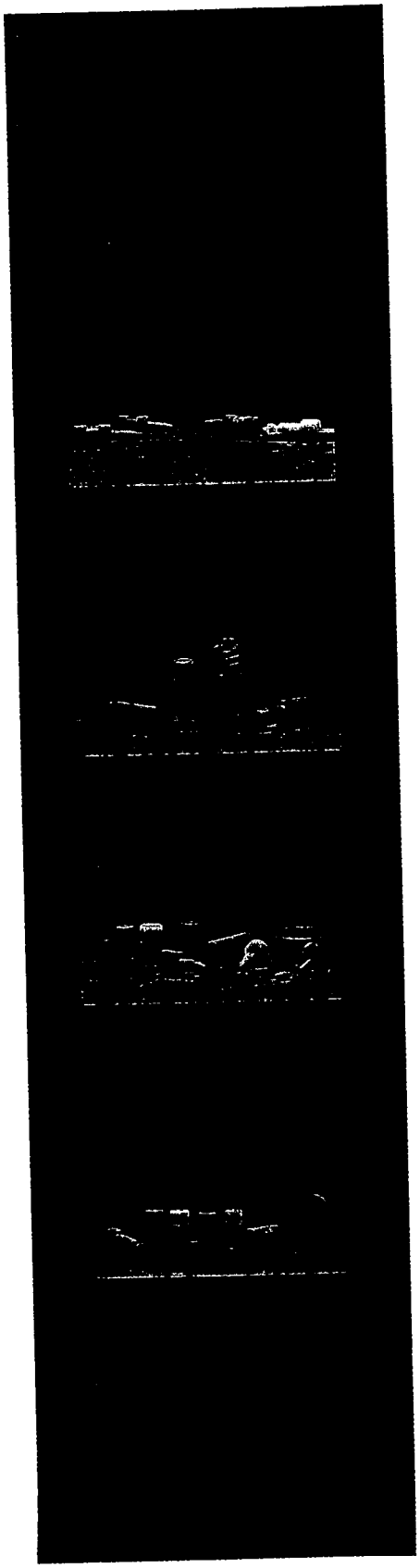
For 1/16" ID Tubing

OPTI-Part #	Description	Price
10-04-00071	2 micron	
10-04-00072	2 micron, 5/Pk	
10-04-00073	10 micron	
10-04-00074	10 micron, 5/Pk	

For 1/8" ID Tubing (Waters Style)

10-04-00115	2 micron
10-04-00119	2 micron, 5/Pk
10-04-00111	10 micron
10-04-00114	10 micron, 5/Pk

FITTINGS & ADAPTERS



Optimize manufactures a comprehensive selection of fittings, unions, adapters and plugs designed for maximum precision and longevity, and minimal dispersion. All of our fittings, from tees and crosses to the smallest double-tight ferrule, are precision-machined exclusively from inert materials. Machined fittings from Optimize are superior to fittings produced using mold-based techniques, as they offer greater concentricity, better consistency in wall thickness and thread profile, greater resistance to breaks, and surface finishes that are free of mold-lines.

Use Optimize fittings for critical connections between the components in your HPLC system, and discover the difference precision can make.

OPTI-LOK™ Adjustable Adapters

OPTI-LOK Adjustable Adapters from Optimize enable you to make zero-dead-volume connections between any 1/4-28 or M6 male fitting and any 10-32 female port. Using a patented two-piece design, OPTI-LOK Adjustable Adapters automatically adjust to fit virtually any manufacturer's standard tube-stop depth (see page 17).

OPTI-LOK™ Adapters

We also offer a useful selection of adapters for making connections between 1/4-28, M6 (Metric), Luer or 10-32 fittings. Use the charts on pages 18-19 to find the correct adapter for your application, or call our Technical Support Department if you do not see the adapter you require.

High Pressure Fittings

We offer a complete line of precision-manufactured 10-32 and M6 fittings, unions, crosses and tees for making high-pressure connections. OPTI-LOK 6K fittings feature a separate nut and double-tight ferrule, for increased gripping power and secure sealing. For precision connections with integrated nut/ferrule fittings, choose OPTI-LOK 1 (see page 20).

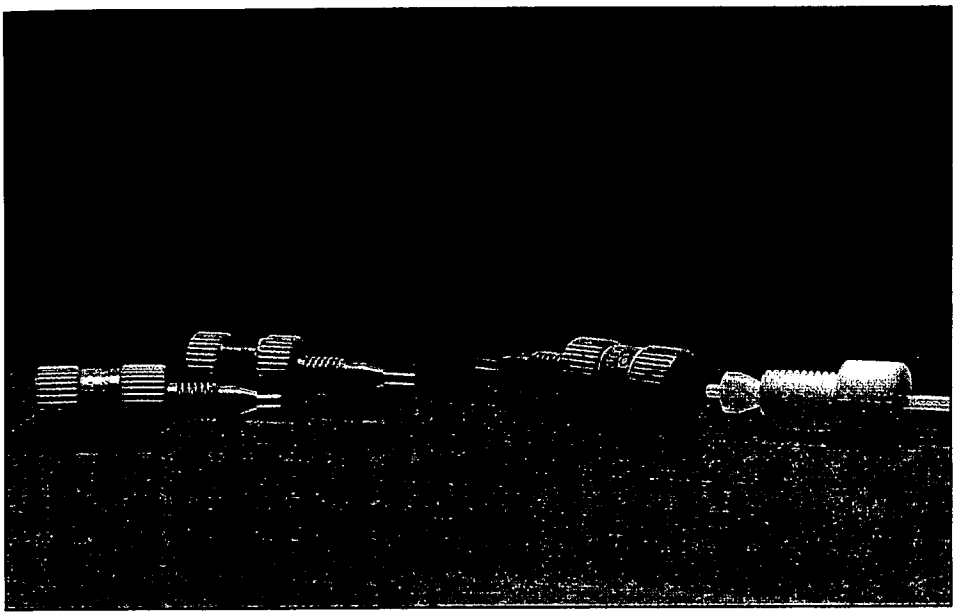
Low Pressure Fittings

For reliable low-pressure connections, OPTI-LOK LP fittings are an excellent choice. With OPTI-LOK LP, you can connect 1/8" and 1/16" OD tubing into flat-bottomed 1/4-28 ports without the need for flanged tube-ends (see page 22).

Custom Manufacturing

If you have a special need for a fitting or other connection accessory not listed in this catalog, let us know. Because we individually machine each fitting we sell, we can custom-manufacture small batches of components at a competitive price. For more information or a price quotation, call Technical Support at 800-669-9015.

ADJUSTABLE ADAPTER



The OPTI-LOK™ Adjustable Adapter will connect any 1/4-28 male fitting to a 10-32 threaded female component. OPTI-LOK is also available for M6 male fitting to 10-32 threaded female port connections.

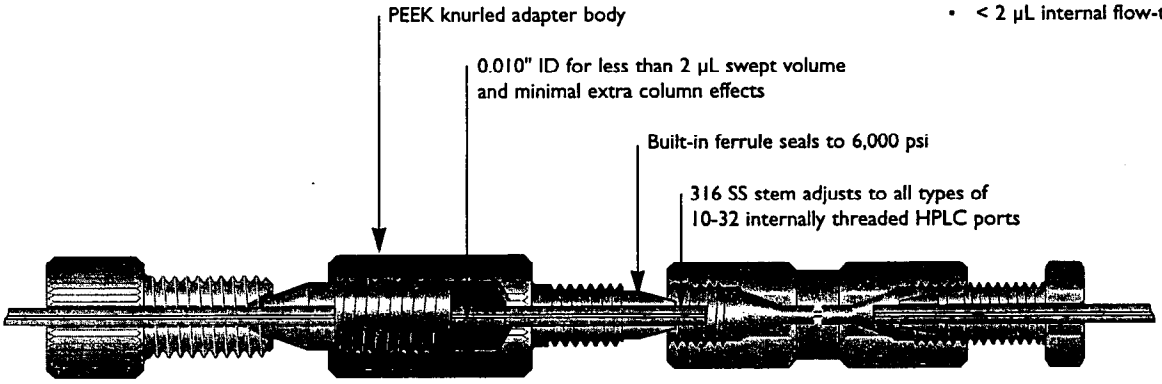
Our unique patented 2-piece design allows the adapter to adjust to virtually any manufacturer's tube stop depth. Simply hand-tighten to provide a perfect zero-dead-volume connection. This adapter is particularly well suited for connecting conventional HPLC columns to systems with polymeric tubing and flanged fittings, such as Pharmacia and Dionex. Reduce your adapter inventory with the OPTI-LOK Adjustable Adapter from Optimize.

OPTI-LOK™ Adjustable Adapter

OPTI-Part #	Description	Price
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

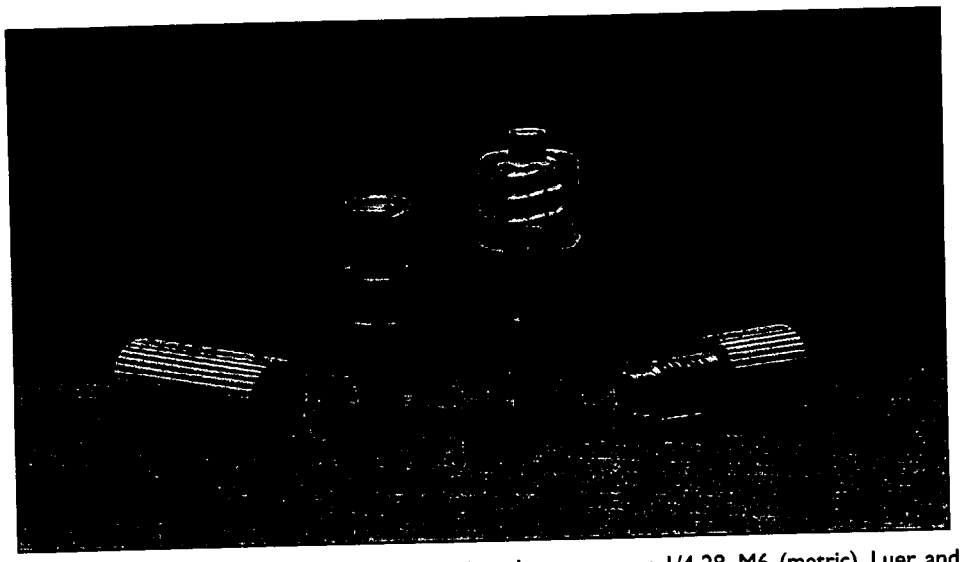
FEATURES

- Overall dimensions: 3/8" diameter x 1 1/4" long.
- 6,000 psi pressure rated.
- 0.010" diameter through-hole.
- < 2 µL internal flow-through volume.



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

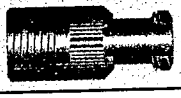
ADAPTERS



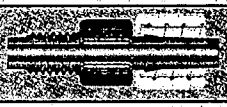
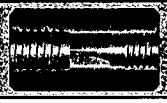
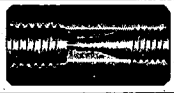
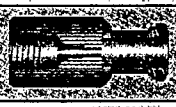
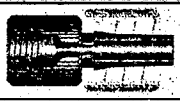
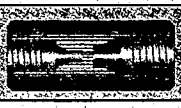
OPTI-LOK™ Adapters offer maximum flexibility for making connections between your 1/4-28, M6 (metric), Luer and 10-32 fittings. They are available in a useful variety of thread-type combinations, all precision-machined from PEEK or stainless steel (SS). Only by individually machining each component can we produce the consistently precise and durable threads that you will find in every fitting, ferrule and adapter we offer.

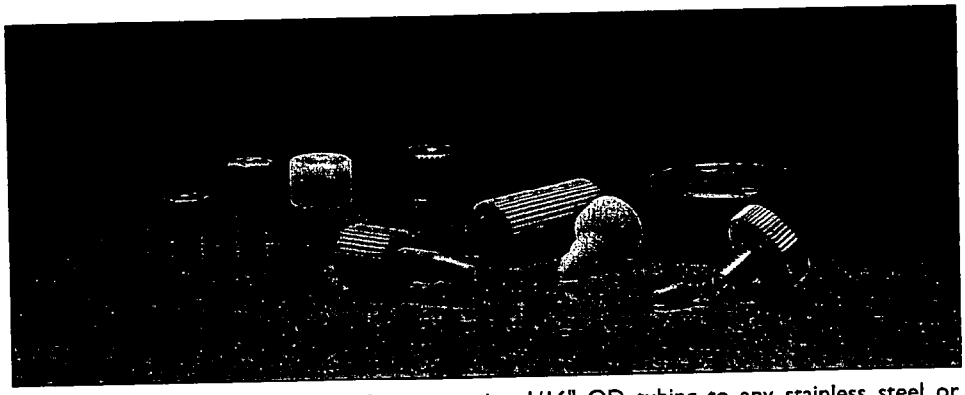
If you can't find the adapter you need in this catalog, please call us. We often produce and stock other adapters that may not be listed here, and we can also custom-manufacture adapters for your particular application.

OPTI-LOK™ Adapters

OPTI-Part #	Wetted Material	Adapts From	Adapter	To	Price
10-23-00350	PEEK	1/4-28 Female		10-32 Parker Style Male	
10-23-00352	PEEK	1/4-28 Female		Luer Female	
10-23-00353	PEEK	1/4-28 Female		Luer Male	
10-23-00351	PEEK	1/4-28 Female		M6 Male	
10-23-00347	PEEK	1/4-28 Male		Luer Female	
10-23-00349	PEEK	1/4-28 Male		Luer Male	

OPTI-LOK™ Adapters

OPTI-Part #	Wetted Material	Adapts From	Adapter	To	Price
10-23-00346	PEEK	1/4-28 Male		M6 Male (with web)	
10-23-00335	PEEK	1/4-28 Male		10-32 Parker Style Male	
10-23-00345	SS	1/4-28 Male		10-32 Parker Style Male	
10-23-00357	PEEK	M6 Female		10-32 Parker Style Male	
10-23-00366	PEEK	M6 Female		Luer Female	
10-23-00355	PEEK	M6 Male		10-32 Parker Style Male	
10-23-00354	SS	M6 Male		10-32 Parker Style Male	
10-23-00356	SS	M6 Male		10-32 Waters Style Male	
10-23-00361	PEEK	M6 Male		Luer Female	
10-23-00363	PEEK	M6 Male		Luer Male	
10-23-00358	PEEK	10-32 Parker Style Male		Luer Male	
10-23-00359	PEEK	10-32 Parker Style Male		Luer Female	
10-23-00364	PEEK	10-32 Parker Style Male		1/4-28 Male Cone	
10-23-00365	SS	10-32 Parker Style Male		1/4-28 Male Cone	



OPTI-LOK™ 6K fittings are ideal for connecting 1/16" OD tubing to any stainless steel or polymeric 10-32 threaded port. For biocompatible applications, use OPTI-LOK 6K PEEK fittings and OPTI-PEEK™ tubing for completely inert high-pressure connections.

OPTI-LOK 10-32 couplers allow convenient connections between female 10-32 ports. These couplers consist of two OPTI-LOK I fittings and a 6 cm stainless steel tube (.006" ID) Internal volume is only 1.4 µL, making OPTI-LOK couplers ideal for connections between filters, guard columns and analytical columns.

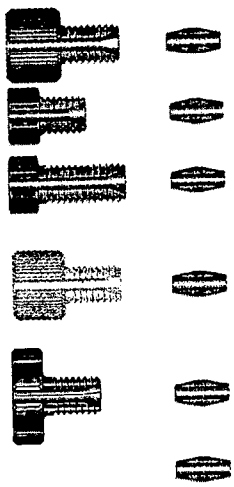
OPTI-LOK unions are well-suited for connecting 10-32 threaded fittings with stainless steel or polymeric tubing. Tees and crosses from Optimize are precision-machined from PEEK, and are available in two different through-hole sizes. OPTI-LOK plugs in PEEK or Acetal offer a low-profile design and will firmly seal 10-32 threaded female ports.

High Pressure Fittings & Plugs for 1/16" Tubing

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

OPTI-Part #	Description	Price
[illegible]	OPTI-LOK I, Knurled	
[illegible]	OPTI-LOK I, Knurled, 10/Pk	
10-20-00264	OPTI-LOK I, PEEK	
10-20-00265	OPTI-LOK I, PEEK, 10/Pk	

OPTI-LOK™ 6K 10-32 Nuts & Ferrules



OPTI-Part #	Description	Price
[illegible]	Nut, Knurled Head, PEEK	
[illegible]	Nut, Knurled Head, PEEK w/ Ferrule (10-20-00269), 10/Pk	
10-20-00271	Nut, Hex Head, Short, PEEK	
10-20-00272	Nut, Hex Head, Short, PEEK, w/ Ferrule (10-20-00269), 10/Pk	
[illegible]	Nut, Hex Head, Long, PEEK	
[illegible]	Nut, Hex Head, Long, PEEK, w/ Ferrule (10-20-00269), 10/Pk	
10-20-00277	Nut, White Acetal, Knurled	
10-20-00278	Nut, White Acetal, w/ PEEK Ferrule (10-20-00269), 10/Pk	
[illegible]	Nut, Knurled Head, SS	
[illegible]	Nut, Knurled Head, SS, w/ PEEK Ferrule (10-20-00269), 10/Pk	
10-20-00269	6K Double Tight Ferrule, PEEK	

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

OPTI-Part #	Description	Price
[illegible]	[illegible]	
10-20-00266	Coupler, PEEK	

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

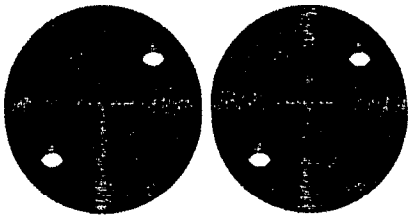
OPTI-Part #	Description	Price
[illegible]	[illegible]	
[illegible]	[illegible]	
10-24-00369	Ferrule, SS	
[illegible]	[illegible]	

10-32 Unions For 1/16" OD Tubing

OPTI-Part #	Description	Price
10-20-00261	Union, PEEK, 0.010" thru	
10-20-00262	Union, PEEK, 0.020" thru	
10-20-00267	Union, PEEK, 0.050" thru	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	

10-32 Tees & Crosses For 1/16" OD Tubing

OPTI-Part #	Description	Price
10-20-00287	Tee, PEEK, 0.020" thru	
10-20-00288	Tee, PEEK, 0.050" thru	
[illegible]	[illegible]	
[illegible]	[illegible]	

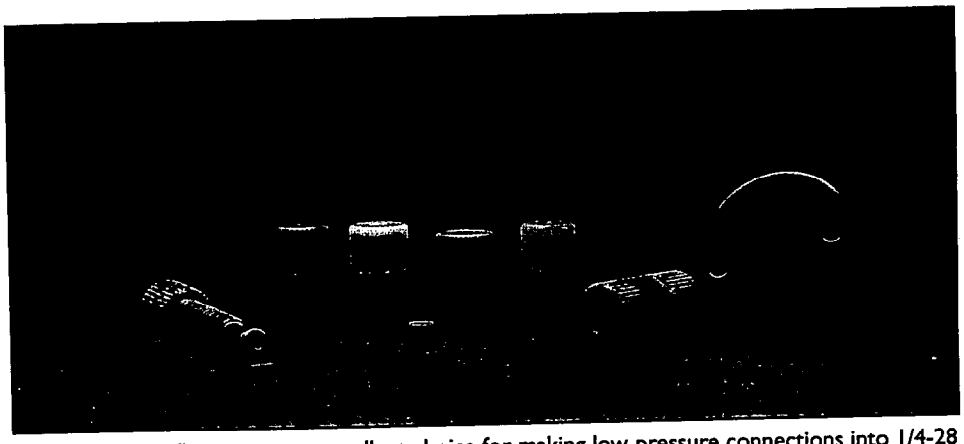


TEE CROSS

10-32 OPTI-LOK™ Plugs

OPTI-Part #	Description	Price
10-20-00257	Plug, White Acetal	
10-20-00253	Plug, White Acetal, 10/Pk	
[illegible]	[illegible]	
[illegible]	[illegible]	
10-20-00255	Plug, Natural PEEK	
10-20-00256	Plug, Natural PEEK, 10/Pk	

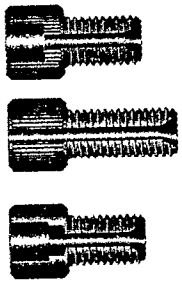
High Pressure Fittings for LDC, Parker, SSI, Valco, & Waters can be found on pages 24-25.



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.

Low Pressure Flat-Bottomed Fittings & Plugs

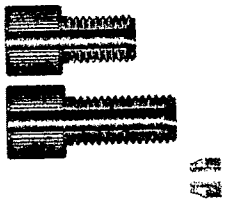
OPTI-LOK™ LP 1/4-28 Nuts & Ferrules For 1/16" OD Tubing



OPTI-Part #	Description	Price
10-21-00290	Nut, Natural PEEK	
10-21-00289	Nut, Black Acetal	
10-21-00293	Nut, White Acetal	
10-21-00294	Nut, White Acetal, w/ Counterbore	
10-21-00292	Nut, Natural Tefzel®	
10-21-00299	Nut, Teflon (PTFE)	
10-21-00291	Nut, Natural PEEK, Long	
10-21-00298	Nut, Hex Head, Nylon	

10-21-00296	Ferrule, Natural PEEK	
10-21-00302	Ferrule, Black PEEK	
10-21-00295	Ferrule, Natural Tefzel	
10-21-00300	Ferrule, Teflon (PTFE)	
10-04-00107	Ferrule, Filter Assembly, PEEK, 2 µm SS Frit	

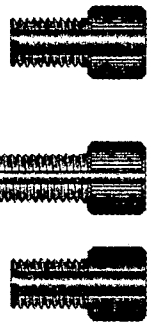
OPTI-LOK™ LP 1/4-28 Nuts & Ferrules For .100" OD Tubing



OPTI-Part #	Description	Price
10-21-00283	Nut, Acetal	
10-21-00284	Nut, PEEK	
10-21-00285	Nut, PEEK, Long	
10-21-00281	Ferrule, Natural Tefzel	

OPTI-LOK™ LP 1/4-28 Nuts & Ferrules For 1/8" OD Tubing

OPTI-Part #	Description	Price
10-21-00307	Nut, Natural PEEK	
10-21-00305	Nut, Black Acetal	
10-21-00310	Nut, White Acetal	
10-21-00311	Nut, White Acetal with Counterbore	
10-21-00306	Nut, Kel-F	
10-21-00309	Nut, Natural Tefzel	
10-21-00317	Nut, Teflon (PTFE)	
10-21-00308	Nut, Natural PEEK, Long	
10-21-00316	Nut, Hex, Nylon	
10-21-00313	Ferrule, Natural PEEK	
10-21-00312	Ferrule, Natural Tefzel	
10-21-00318	Ferrule, Teflon (PTFE)	
10-04-001092	Ferrule, Filter Assembly, PEEK, 2 µm SS Frit	



1/4-28 Unions

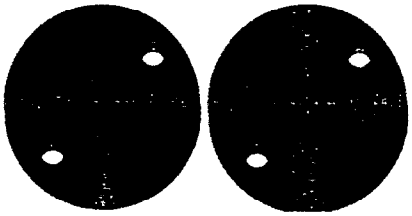
OPTI-Part #	Description	Price
10-21-00322	Union, Square, Polypropylene	
10-21-00323	Union, Knurled, PEEK	
10-21-00327	Union, Hex, Natural Nylon, Long	

1/4-28 PEEK Unions, Knurled With Wrench Flats

OPTI-Part #	Description	Price
10-21-00341	Union, PEEK, .010" thru, web	
10-21-00342	Union, PEEK, .020" thru, web	
10-21-00344	Union, PEEK, .030" thru, web	
10-21-00336	Union, PEEK, .040" thru, web	
10-21-00343	Union, PEEK, .050" thru, web	

1/4-28 Tees & Crosses

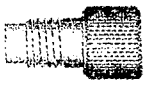
OPTI-Part #	Description	Price
10-21-00279	TEE, .020" thru, PEEK	
10-21-00280	TEE, .050" thru, PEEK	
10-21-00286	TEE, .062" thru, PEEK	
10-21-00332	CROSS, .020" thru, PEEK	
10-21-00282	CROSS, .050" thru, PEEK	



TEE CROSS

OPTI-LOK™ LP 1/4-28 Plugs

OPTI-Part #	Description	Price
10-21-01292	Plug, White Acetal	
10-21-00326	Plug, Teflon (PTFE)	



FITTINGS

Optimize manufactures OPTI-LOK™ M6 fittings for metric applications. We also offer LDC style and SSI style fittings for the special connection requirements of LDC and SSI HPLC systems.

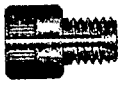
OPTI-LOK™ M6 Metric, LDC & SSI Style Fittings

OPTI-LOK M6 Metric Union

OPTI-Part #	Description	Price
[illegible]	Union, Natural Nylon	

OPTI-LOK M6 Metric Nuts & Ferrules for 1/16" OD Tubing

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

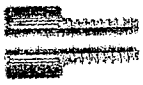


OPTI-Part #	Description	Price
10-22-00328	Nut, PEEK, Knurled w/Hex	
10-22-00329	Nut, PEEK, Knurled w/Hex w/Ferrules (10-20-00269) 10/Pk	
[illegible]	Double Tight Ferrule, PEEK	

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

OPTI-Part #	Description	Price
10-22-00297	Nut, White Acetal	
[illegible]	Ferrule, Natural Tefzel, Short	
[illegible]	Ferrule, PEEK	

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



OPTI-Part #	Description	Price
10-22-00314	Nut, White Acetal	
10-22-00315	Nut, Black Acetal	
[illegible]	Ferrule, Natural Tefzel, Short	
[illegible]	Ferrule, PEEK	

OPTIMIZE Universal Metric Fittings for 1/16" Tubing

OPTI-Part #	Description	Price
10-24-00368	Universal Nut, SS	
10-24-00377	Universal Nut, w/ SS Ferrules (10-24-00369) 10/Pk	
[illegible]	Ferrule, PEEK	
10-24-00369	Ferrule, SS	

LDC Style 5/16-24 Fittings

OPTI-Part #	Description	Price
[illegible]	Nut & Ferrule for 1/16" Discharge Tube, SS	
31-24-00736	Nut & Ferrule for 1/16" Discharge Tube, SS	

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

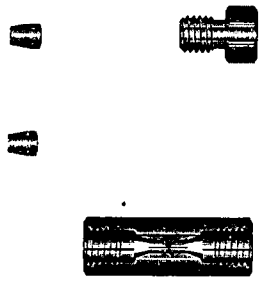
OPTI-Part #	Description	Price
[illegible]	Nut, SS	
[illegible]	Nut, SS w/Ferrules (10-24-00369) 10/Pk	
36-24-01674	Ferrule, SS	
[illegible]	Ferrule, PEEK	
10-20-00330	Nut, 1/4-28 6K PEEK	
[illegible]	Nut, 1/4-28 6K PEEK w/Ferrules (10-20-00269) 3/Pk	
10-20-00269	Double Tight Ferrule, PEEK	

Optimize Technologies offers genuine Valco fittings, as well as Waters and Parker style nuts and ferrules for most 1/16" OD tubing. All fittings are precision machined from type 316 SS. These Waters style and Parker style fittings are manufactured by Optimize Technologies.

Stainless Steel & PEEK Fittings

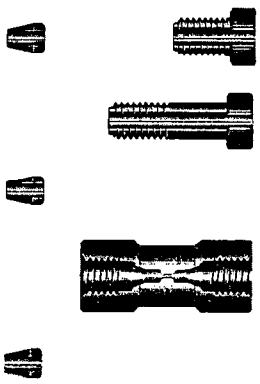
Parker Style 10-32 Fittings for 1/16" OD Tubing

OPTI-Part #	Description	Price
40-24-01275	Nut, SS	
40-24-01276	Nut, SS with Ferrules, (40-24-01291), 10/Pk	
40-24-01291	Ferrule, SS	
40-24-01290	Ferrule, PEEK	
40-24-01271	Union, SS, .010" thru (with SS Nuts & Ferrules)	
40-24-01273	Union, SS, .020" thru (with SS Nuts & Ferrules)	



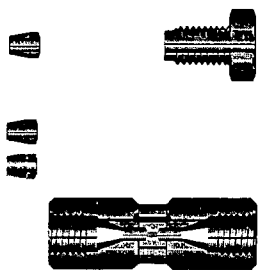
Genuine Valco 10-32 Fittings for 1/16" OD Tubing

OPTI-Part #	Description	Price
41-24-01277	Nut, SS	
41-24-01281	Nut, SS with Ferrules, (41-24-01279), 10/Pk	
41-24-01278	Nut, Long, SS	
41-24-01279	Ferrule, SS	
41-24-01283	Union, SS, .010" thru (with SS Nuts & Ferrules)	
41-24-01280	Union, SS, .029" thru (with SS Nuts & Ferrules)	
41-24-01282	Ferrule, PEEK	



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

OPTI-Part #	Description	OEM #	Price
39-24-01090	Compression Screw, SS	05070	
39-24-01091	Screw with Ferrules, (39-24-01291), 10/Pk	25604	
39-24-01291	Ferrule, SS	05063	
39-24-01290	Ferrule, PEEK	21817	
39-24-01088	Union, SS, with SS Nuts & Ferrules	97332	



TUBING

Teflon® (PTFE) Precut Tubing

This LC-grade Teflon tubing from Optimize is made using only premium grade virgin PTFE, with less than 0.01% liquid absorption.

1/16" Outside Diameter Teflon Tubing

OPTI-Part #	Description	Price
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
10-15-00220	.020" ID x 10 ft Natural	
10-15-00221	.020" ID x 50 ft Natural	
10-15-00218	.020" ID x 10 ft Black	
10-15-00219	.020" ID x 50 ft Black	
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
10-15-00232	.040" ID x 10 ft Natural	
10-15-00233	.040" ID x 50 ft Natural	
10-15-00230	.040" ID x 10 ft Black	
10-15-00231	.040" ID x 50 ft Black	

.100" Outside Diameter Teflon Tubing

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

1/8" Outside Diameter Teflon Tubing

10-15-00238	.062" ID x 10 ft Natural	
10-15-00240	.062" ID x 50 ft Natural	
10-15-00236	.062" ID x 10 ft Black	
10-15-00237	.062" ID x 50 ft Black	

3/16" Outside Diameter Teflon Tubing

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

Tefzel® (ETFE) Precut Tubing

Solvent resistance, high-pressure performance and handling ease make Tefzel a good replacement for SS or Teflon tubing. For a completely inert flow path, connect your tubing with OPTI-LOK™ 1/4-28 or 10-32 fittings in Tefzel or PEEK.

1/16" Outside Diameter Tefzel Tubing

OPTI-Part #	Description	Price
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
10-14-00196	.020" ID x 10 ft	
10-14-00197	.020" ID x 50 ft	
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

1/8" Outside Diameter Tefzel Tubing

10-14-00202	.062" ID x 10 ft	
10-14-00203	.062" ID x 50 ft	

BURST PRESSURE TABLE

Outside Diameter	Inside Diameter	Burst Pressure*
TEFLON TUBING		
1/16"	.010" - .032"	1,400 psi
1/16"	.040"	1,000 psi
.100"	.040"	800 psi
1/8"	.062"	800 psi
3/16"	.125"	600 psi
TEFZEL TUBING		
1/16"	.010"	4,000 psi
1/16"	.020"	3,000 psi
1/16"	.030"	2,000 psi
1/8"	.062"	1,000 psi
PEEK TUBING		
1/16"	.006" - .010"	12,000 psi
1/16"	.020"	8,000 psi
1/16"	.030"	5,000 psi
1/16"	.040"	3,000 psi
1/8"	.062"	2,000 psi

*NOTE: This table is supplied only as a guide to assist you in determining the correct tubing type and size. Rather than being based on continuous use, the burst pressures listed were determined as a result of our testing to find the absolute burst pressure limit. Your routine operating pressure for any tubing should include a margin of safety based on your application.

OPTI-PEEK™ Precut Tubing

OPTI-PEEK tubing offers better solvent compatibility and high pressure performance than other brands of PEEK tubing. For Ion-chromatography and biocompatible applications, OPTI-PEEK is an excellent choice. For optimal performance, use OPTI-LOK 6K PEEK fittings and double-tight ferrules.

1/16" Outside Diameter PEEK Tubing

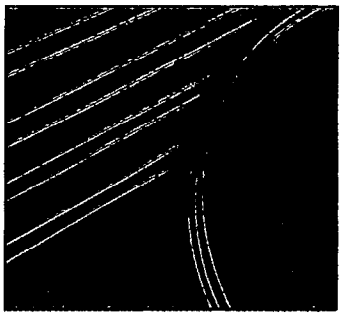
OPTI-Part #	Description	Price
[illegible]	[illegible]	
[illegible]	[illegible]	
10-13-00175	.010" ID x 10 ft	
10-13-00177	.010" ID x 50 ft	
[illegible]	[illegible]	
[illegible]	[illegible]	
10-13-00187	.030" ID x 10 ft	
10-13-00191	.030" ID x 50 ft	
[illegible]	[illegible]	
[illegible]	[illegible]	

1/8" Outside Diameter PEEK Tubing

10-13-00171	.062" ID x 10 ft	
10-13-00174	.062" ID x 50 ft	

Stainless Steel Precut Tubing

Optimize offers LC-grade 316 SS tubing, straightened and square-cut for solid, burr-free connections. SS tubing from Optimize is passivated, water washed and flushed with HPLC grade methanol prior to shipment. Tubing is also available for bulk-purchase in longer lengths.



1/16" Outside Diameter Stainless Steel Tubing

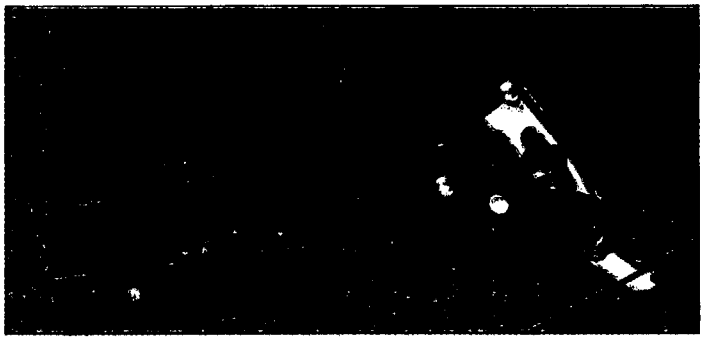
OPTI-Part #	Description	Price
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
10-12-00151	.010" ID x 6 cm	
10-12-00148	.010" ID x 10 cm	
10-12-00149	.010" ID x 20 cm	
10-12-00150	.010" ID x 30 cm	
10-12-00146	.010" ID x 10 ft	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
10-12-00162	.030" ID x 6 cm	
10-12-00160	.030" ID x 10 cm	
10-12-00161	.030" ID x 20 cm	
10-12-00158	.030" ID x 10 ft	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	
[illegible]	[illegible]	

Tubing Cutters

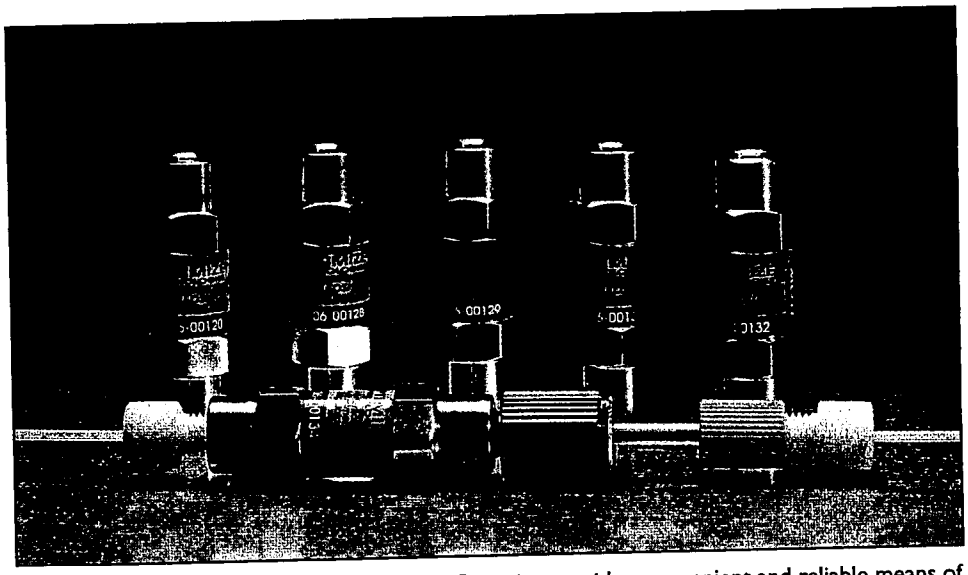
These unique tubing cutters give you a clean, straight cut every time. The plastic tubing cutter features a slotted housing which holds all sizes of our plastic tubing perpendicular to the blade.

The Optimize stainless steel tubing cutter offers a quick, efficient method to cut tubing without collapsing it. This tool works extremely well on narrow bore tubing in which the ID is .006" to .020".

OPTI-Part #	Description	Price
10-10-00139	Plastic Tubing Cutter	
10-10-00140	Stainless Steel Tubing Cutter	



BACK PRESSURE REGULATORS



Flow-through back pressure regulators from Optimize provide a convenient and reliable means of introducing controlled amounts of back pressure in your HPLC flow path. Optimize back pressure regulators are more than just flow restrictors; they are designed to maintain constant back pressure regardless of mobile phase viscosity or flow rate. Use them downstream from your detector to prevent solvent outgassing and bubble formation in the detector cell.

Optimize offers adjustable back pressure regulators designed to provide back pressures in the 0-150 psi range. Adjustment is made via a positive locking mechanism, allowing you to select the back pressure you need, and be sure that pressure will be maintained. These regulators have an internal volume of 100 µL, and are supplied with OPTI-LOK™ LP fittings, complete instructions and an adjustment tool. They are available in pre-set pressures of 10, 30, 60, 100 or 150 psi. For regulators preset at pressures not listed, please contact Customer Service.

Adjustable Back Pressure Regulator

OPTI-Part #	Description	Price
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

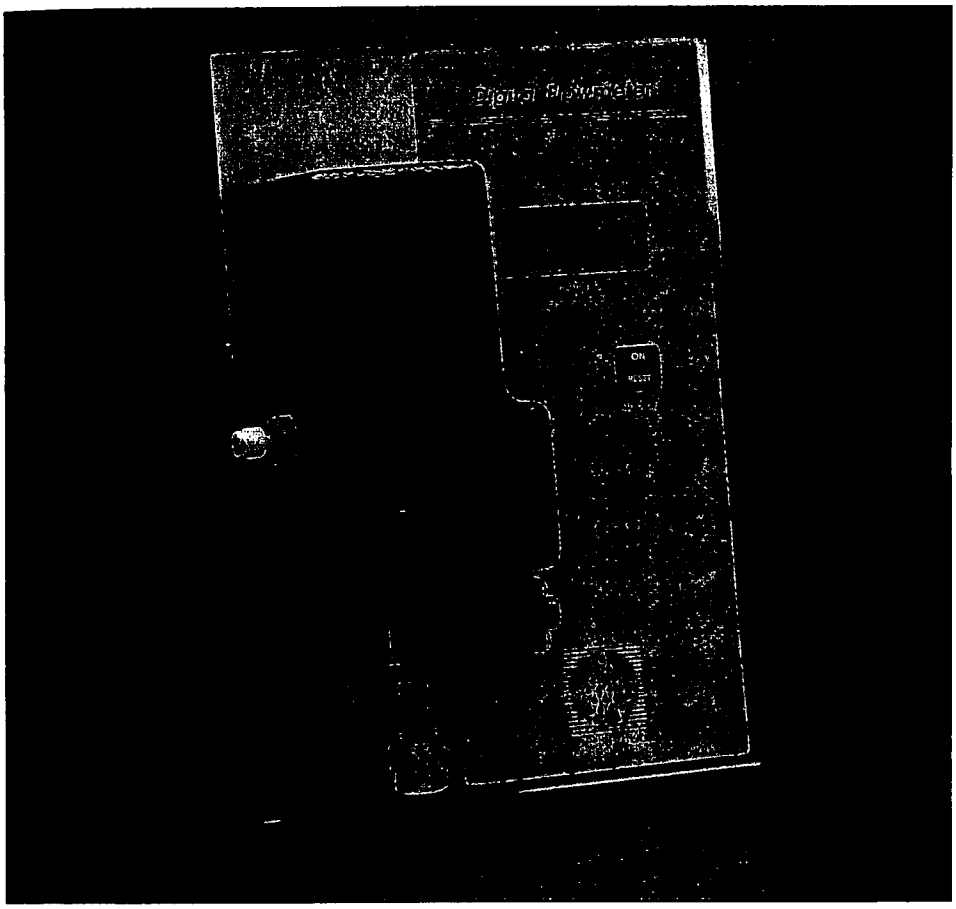
For ultimate convenience in adjustable back pressure regulation, our External Adjustment Regulator is an optimal choice. Any back pressure from 0 to 100 psi can be dialed in simply by turning the external adjustment knob. This regulator is ideal for use in stream splitting applications, and wherever easily accessible fine-tuning of back pressure is a necessity. The External Adjustment Regulator has an internal volume of 100 µL, and is supplied with OPTI-LOK LP fittings and Tefzel® connecting tubing.

External Adjustment Regulator

OPTI-Part #	Description	Price
10-06-00134	External Adjustment Regulator	

OPTI-FLOW™

Your chromatographic results depend on the capability of your HPLC system to deliver accurate flow rates. On most HPLC systems, however, there is no simple way to directly measure the flow rate being delivered; only indirect information such as back-pressure readings are readily available. With the OPTI-FLOW Digital Flowmeter for HPLC, accurate measurement of flow rate becomes a routine procedure. With OPTI-FLOW, you can perform standard ISO, GMP and GLP pump calibration requirements, as well as monitor post-detector flow volume, without interrupting the HPLC run in progress.



OPTI-FLOW™ Flowmeter

OPTI-Part #	Description	Price
10-40-01677	OPTI-FLOW Package, Digital Liquid Flowmeter & Software (with 110V Adapter)	
10-40-01905	OPTI-FLOW Package, Digital Liquid Flowmeter & Software (CE Marked with 220V Adapter)	

FEATURES

- True Volumetric-based results.
- NIST-traceable. (certificate provided)
- On-line monitoring facilitates troubleshooting of the flow rate without interruption of the run.
- Automatic flow rate update.
- Flow range: 0.100 to 30.0 mL/min
- Inert wetted surfaces: glass, PTFE and stainless steel.
- Microsoft Windows™ 3.0 or DOS software available.

SPECIFICATIONS

- Accuracy: +/- 1%
- Repeatability: 0.5%
- 70 µL sample volume
- 110 or 220 volts

SOFTWARE OPTION

- To fully automate the acquisition and archiving of flow rate data, Optimize offers a software package for DOS and Windows*, which includes:

  - Software
  - RS232 module
  - 10' serial cable
  - 3' flowmeter cable

* Minimum Requirements: 286 PC and Windows 3.0 or higher.

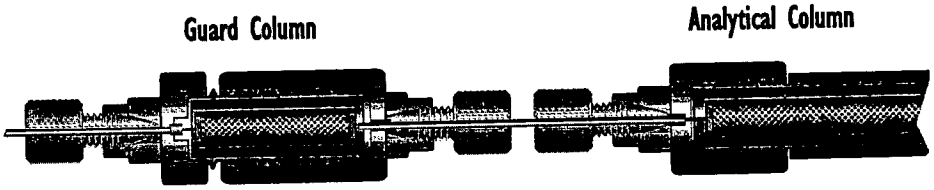
Guard Columns: Selecting Optimal Precolumn Protection For Your HPLC

Liquid chromatography has become an increasingly sophisticated separatory technique over the last two decades, as advances in instrument technology have led the way to lower detection limits, increased automation and more powerful data-handling capabilities. In similar fashion, improvements in packing material and column design have led to more efficient, selective and reproducible separations. Even with these substantial design improvements, however, the analytical column continues to be a problematic link in the HPLC component chain. With the cost of quality analytical columns continually increasing, and with the price of some specialty analytical columns reaching into the thousands of dollars, effective precolumn protection is a wise precaution in today's cost-conscious HPLC laboratory.

Choosing A Guard: Factors to Consider

When it comes to choosing a guard column, there are several factors that are important to consider. The fundamental role of a guard column is to trap particulates, chemical contaminants and other foreign material in order to prevent them from fouling the analytical column. A guard column containing the same type of packing material as the analytical column will usually provide the best protection. Chemical contaminants and other substances with a propensity for fouling octadecyl stationary phases would be best trapped by an octadecyl guard column; contaminants that cause deterioration of a particular packing material would first attack the stationary phase in the sacrificial guard, protecting the analytical column for as long as the capacity of the guard column will allow.

A second factor to consider is a guard column's potential for contributing dispersion through introduction of extra-column volume. The installation of a guard column requires that additional connections, and often extra tubing, be incorporated in a section of the chromatograph where excessive dead volume can literally make or break an assay. A well-designed guard column will minimize the amount of extra tubing required for connection to the analytical column, thus minimizing extra-column dispersion.

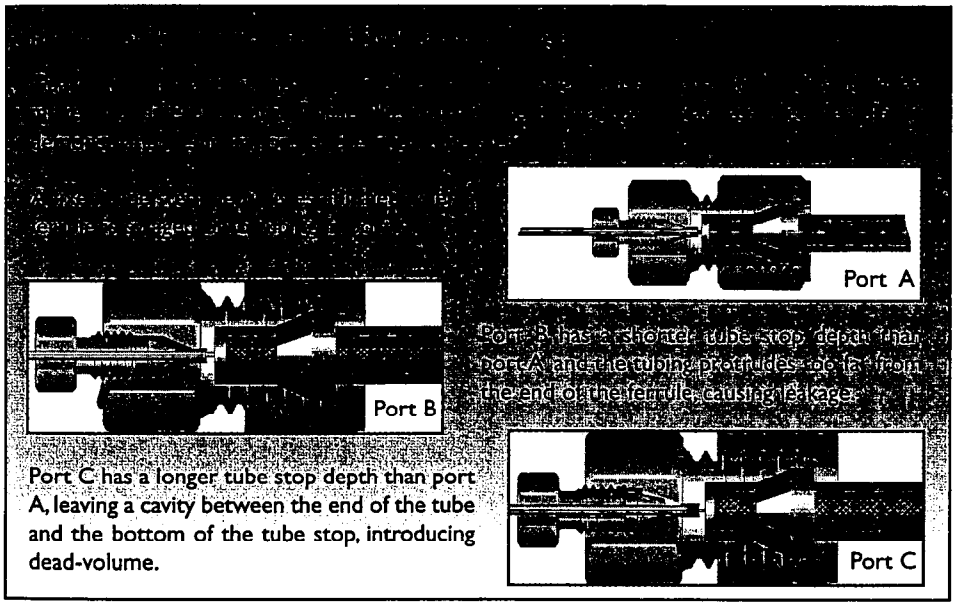


Some guard columns can contribute to extra-column dispersion, as they must be connected using additional tubing and fittings.

When selecting optimal precolumn protection for your HPLC, you should also consider potential ways in which the guard column will affect separation efficiency. To use a guard column is to extend the length of the packing bed by a finite distance. A well-designed guard column will impart minimal influence on the efficiency of the analytical separation. A guard column that affects efficiency to any great degree will cause problems when validation time arrives, or when the guard itself must be replaced. Pellicular packing materials of larger particle size (40 µm) can provide effective precolumn protection without significantly influencing the characteristics of the separation, but internal column dimensions must be minimized and tightly controlled to prevent losses in efficiency. Microparticulate stationary phases with particles of 3-5 µm provide greater capacity, but can have a potentially larger effect on separation efficiency.

Optimal Protection By Design

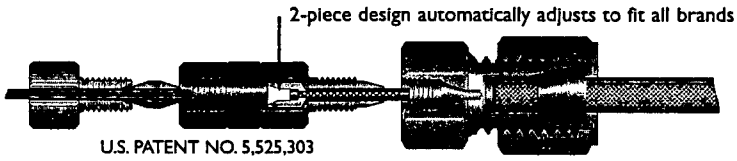
If a prospective guard column is to provide optimal performance and protection for your analytical column, it must address the physical and chemical constraints previously mentioned. OPTI-GUARD™ 1mm and 3mm Guard Columns from Optimize have been designed to offer reliable low-dispersion column protection, while eliminating any chance of dead-volume introduction in the precolumn region. OPTI-GUARD offers tool-free connection with an automatically adjusting tube stem for perfect zero-dead-volume connections, regardless of the analytical column manufacturer's tube stop depth. This patented design guarantees that the tube stem of any OPTI-GUARD will automatically bottom out securely against the tube stop of virtually any 10-32 female port. Some guard columns incorporate molded one-piece couplers or swaged-on ferrules that establish a fixed tube-stop depth for connection to the analytical column. Guards with fixed tube stems will invariably introduce either dead-volume or leaks at the connection with the analytical column when they are switched from one port to another. This situation can occur even when a fixed-stem guard column is switched between different 10-32 ports from the same manufacturer. Because tube stop depth will vary from port to port due to normal manufacturing tolerances, a guard column that utilizes a fixed tube stem will often leak or introduce dead volume when it is switched between different female 10-32 ports (see below).



Port B has a shorter tube stop depth than port A and the tubing protrudes too far from the end of the ferrule, causing leakage.

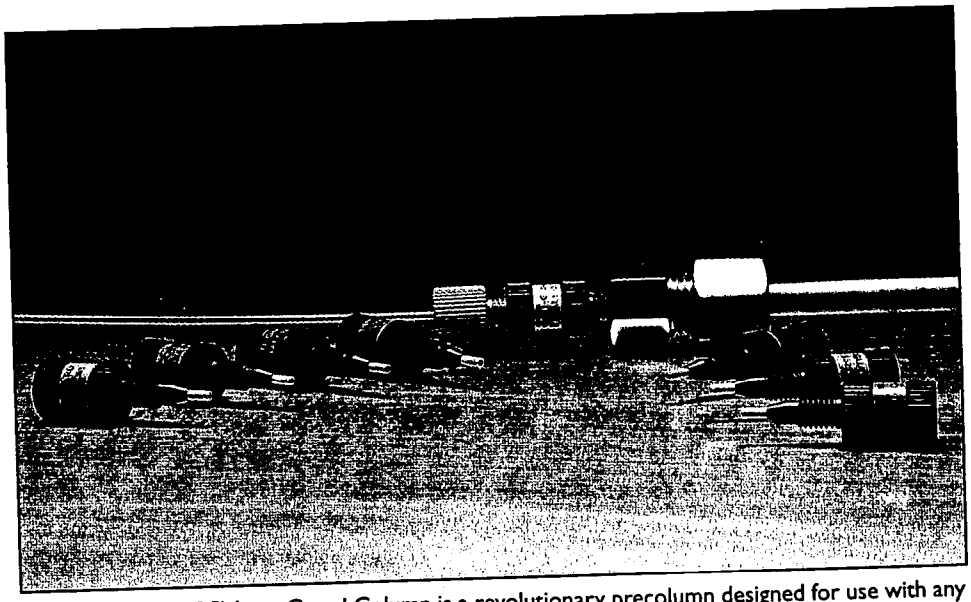
Port C has a longer tube stop depth than port A, leaving a cavity between the end of the tube and the bottom of the tube stop, introducing dead-volume.

Ideally, a guard column should perform its primary function of column protection in a manner that is as chemically transparent as possible to the chromatographic separation. When selecting a guard column, choose high quality packing materials that are a good match for the stationary phase of your analytical column. Also, be sure that the guard column you select is designed to minimize extra-column effects. Guards that avoid fixed or pre-swaged tube stems, and connect directly to the analytical column without the need for extra tubing, are the optimal choice.



OPTI-GUARD columns use an adjustable tube stem design for zero-dead-volume connections every time.

OPTI-GUARD™ 1mm



The OPTI-GUARD™ 1mm Guard Column is a revolutionary precolumn designed for use with any HPLC column. The unique patented design of the OPTI-GUARD 1mm provides a perfect zero-dead-volume connection every time, without the need for a special holder. This versatile design makes the OPTI-GUARD 1mm an excellent choice for protecting all of your analytical, mini and microbore columns. When selecting a guard column, however, it is important to consider what it won't do, as well as what it will do. The OPTI-GUARD will not affect the efficiency of your chromatographic separation; your resulting chromatograms will remain virtually identical to those obtained without a precolumn. For maximum versatility and minimal extra-column effect, make OPTI-GUARD 1mm your first choice in precolumn protection.

FEATURES

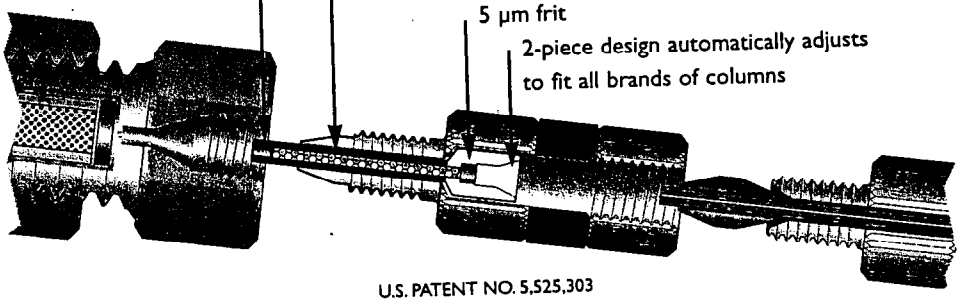
- No holder needed.
- Depth filtration design.
- Color – coded.
- Completely disposable.
- Compatible with any 10-32 column – unique, packed tube stem automatically adjusts to fit all brands of columns, assuring perfect zero-dead-volume connections.
- Simple hand-tight connection.
- Several OPTI-GUARD Guard Columns can be connected in series to combine chemistries or give added length.
- No bigger than most hand tight fittings – attaches directly to the column, fitting into most column heaters.

SPECIFICATIONS

- Overall dimensions: 3/8" diameter x 1" long.
- 1.5 cm x 1 mm packed bed.
- 6,000 psi pressure rated.
- Depth Filtration Design.
- Available in reverse and normal phase chemistries.

MATERIALS

- Techtron® PPS (Polyphenylene Sulfide)
- 316 Stainless Steel
- PEEK

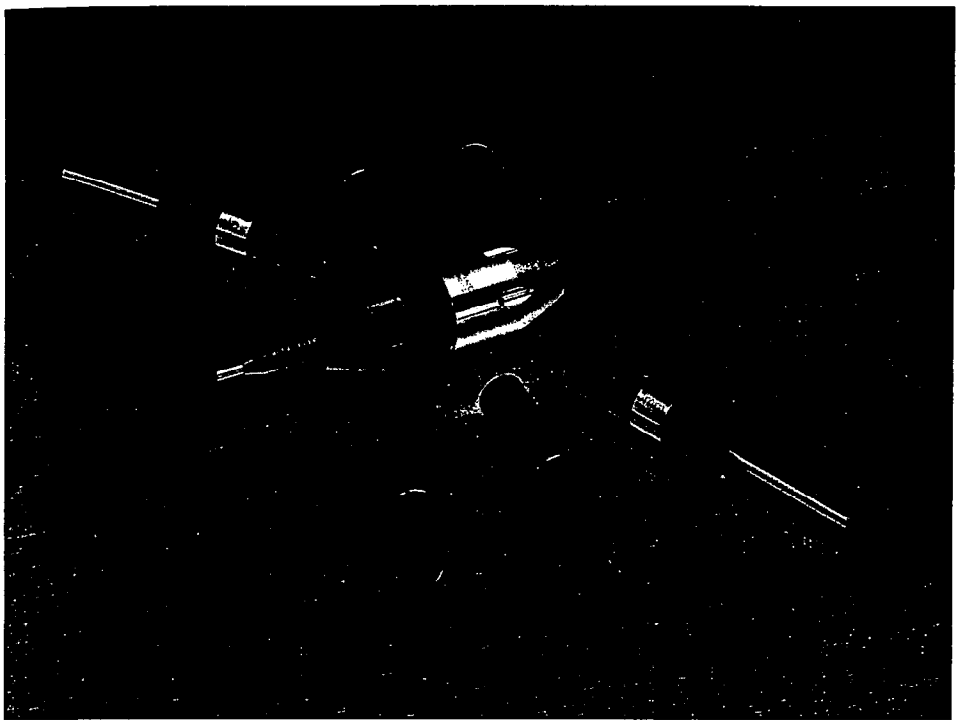


U.S. PATENT NO. 5,525,303

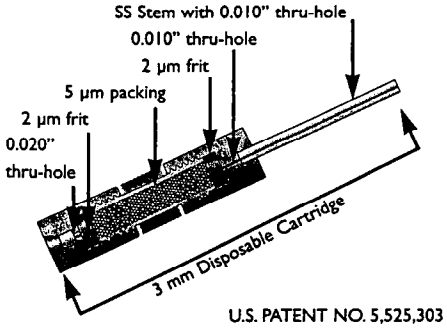
OPTI-GUARD™ 1mm Guard Column

OPTI-Part #	Packing Description	Color	Qty.	Price
[illegible]	[illegible]	[illegible]	5	
10-02-00010	C_8	Yellow	15	
[illegible]	[illegible]	Orange	[illegible]	
10-02-00018	Phenyl	Green	15	
[illegible]	[illegible]	Blue	[illegible]	
10-02-00026	NH_2	Red	15	
[illegible]	Anion Exchanger	Black	[illegible]	
10-02-00034	Cation Exchanger	White	15	

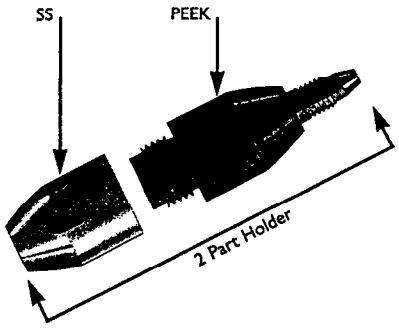
OPTI-GUARD™ 3mm



The new OPTI-GUARD™ 3mm Guard Column is a revolutionary precolumn designed for use with any HPLC analytical column. The patented design of the OPTI-GUARD 3mm incorporates many of the features of the OPTI-GUARD 1mm Guard Columns, including tool-free zero-dead-volume connection and an automatically adjusting tube stem. This new addition to the OPTI-GUARD family continues a tradition of reliable performance with minimal influence on your chromatography. The OPTI-GUARD 3mm Guard Column is designed to provide optimal protection for your analytical column. For increased capacity and minimal extra-column effect, choose the OPTI-GUARD 3mm Guard Column.



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



OPTI-GUARD™ 3mm Guard Column

OPTI-Part #	Packing Description	Qty.	Price
[illegible]	[illegible]	[illegible]	[illegible]
10-02-01485	C_8 Cartridge	3	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
10-02-01722	C_1 Cartridge	3	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
10-02-01491	Silica Cartridge	3	[illegible]
[illegible]	Holder	1	[illegible]

FEATURES

- Replaceable/disposable cartridge.
- Six bonded phases.
- Compatible with any 10-32 column – tube stem automatically adjusts to fit all brands of columns, assuring perfect zero-dead-volume connections.
- Simple hand-tight connection.
- Attaches directly to the column, requiring no additional tubing or fittings.
- Application versatility & loadability.
- Chemical stability.
- Mechanical stability.

SPECIFICATIONS

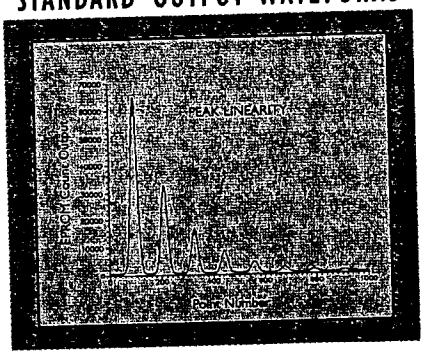
- 1.5 cm x 3 mm packed bed.
- 6,000 psi pressure rated.
- Packing:
  Kromasil™ 100Å – a spherical, totally porous, silica-based chromatography material, developed and manufactured to meet the exacting standards of modern liquid chromatography. Developed for both analytical and preparative HPLC.

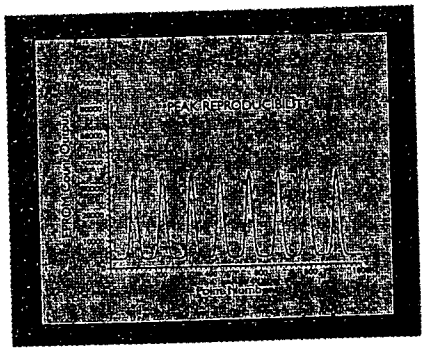
MATERIALS

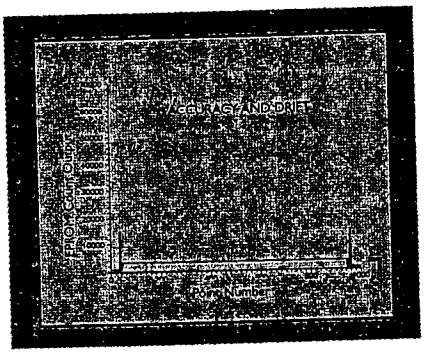
- 316 Stainless Steel
- PEEK

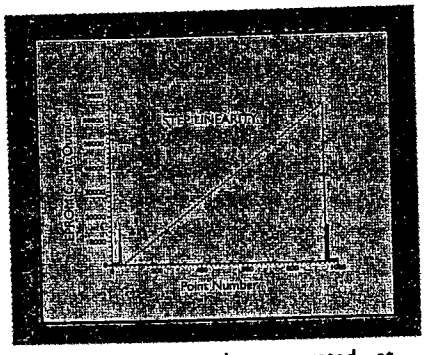
VP-2

STANDARD OUTPUT WAVEFORMS

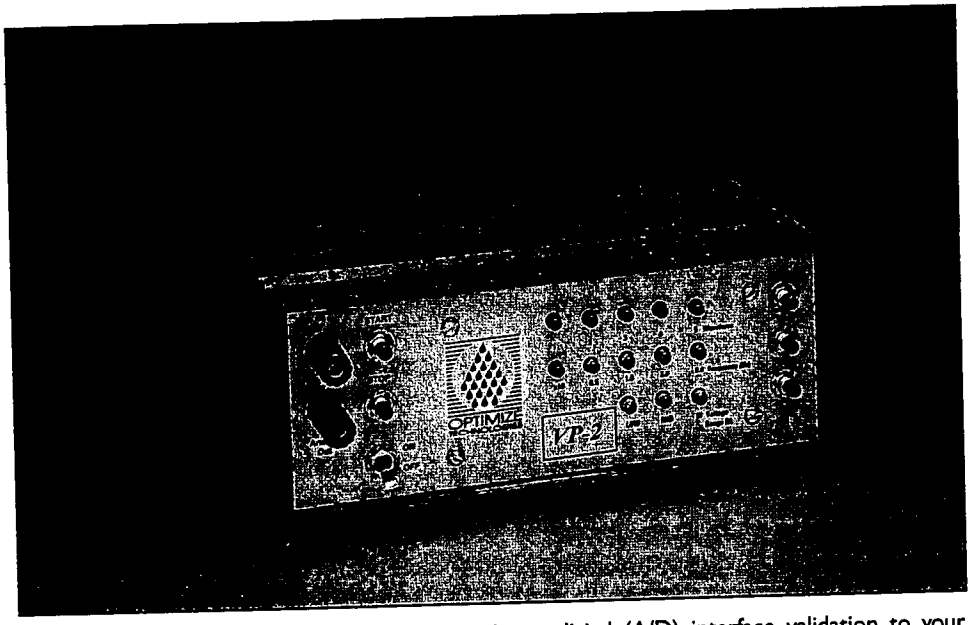








Waveforms may be generated at different speeds to simulate a variety of chromatographic peaks.



Bring the power of reliable and certifiable analog-to-digital (A/D) interface validation to your laboratory with the VP-2 A/D Interface Verification System from Optimize. The VP-2 is designed to verify the linearity, reproducibility and accuracy of your A/D interface. It generates NIST-traceable predefined waveforms that can be read by your data acquisition system, and measures the performance of your interface via software-based comparisons of collected data to original waveforms generated by the VP-2.

A/D Interface Validation For Your Lab

Everything from acquisition and analysis of the chromatographic data to control of instrument parameters can now be handled by dedicated workstations and LIMS systems. Computer-based data acquisition requires that chromatograms be transferred to the digital domain via analog-to-digital interface prior to storage and subsequent processing. If the primary goal of a thorough validation procedure is to verify the linearity, reproducibility and accuracy of the HPLC system as a whole, this validation procedure should take into account the performance of the data-acquisition system, and more specifically that of the A/D interface. Most regulatory entities already require that routine validation procedures be extended to cover the software and hardware of HPLC data-acquisition systems. The VP-2 A/D Verification System enables you to perform NIST-traceable validation of your data acquisition system, giving you the power to meet these validation requirements in your laboratory.

The VP-2 works by generating predefined waveform voltages (referred to as "KEY" waveforms) that can be read by the A/D interface under study. Interfaces are validated by comparing the waveform as collected by the data acquisition device (referred to as the "TEST" waveform) to the KEY waveform. Waveforms are stored on a Zero-Insertion Force (ZIF) EPROM. This easily changed chip allows access to alternate waveforms simply by switching EPROMs. Predefined digital waveforms are converted to analog waveform voltages by a high resolution 22-bit digital to analog converter, and can be output at variable speeds, allowing simulation of a wide variety of chromatographic peaks (see charts at left).

Chromatographic Software Validation EPROM & Custom EPROMs

Chromatographic software validation can be performed using an optional HPLC Software EPROM. Single level, multi-level and internal standard usage can be simulated and output to the A/D interface under study. These waveforms allow for testing of software algorithms, such as those defining start and stop points for peaks, or governing the separation and quantification of several fused peaks. If you wish to test a particular software feature for which a suitable waveform is not available, a custom-programmed EPROM containing appropriate waveforms can be purchased. Please contact Optimize for more information about the availability of custom EPROMs for the VP-2.

Potentiometer-Free Calibration, NIST Traceability

All VP-2 hardware calibrations are performed using the included software. There are no analog potentiometers used in calibration, as these are mechanical devices, and are hence subject to drift with time. The absence of potentiometers ensures optimal performance and reliability between calibrations. The accuracy of waveform voltages output by the VP-2 is directly traceable to the National Institute of Standards and Technology. During initial calibration and subsequent recalibration, the accuracy of the VP-2 is certified by a NIST-traceable voltmeter. Each of the VP-2 waveforms are output to this voltmeter at each of the possible voltage ranges. Any deviations from ideal observed during calibration are stored in the VP-2 software, which can then display the traceable voltage output calibrated to the specific VP-2 waveform generator. Thus, each VP-2 will have its own unique calibration file, individually matched by serial number to the instrument itself. A certificate of calibration is provided with each new unit, and with each annual recertification.

FEATURES

- High resolution 22-bit digital to analog (D/A) converter.
- User selectable output voltage range: 0 to 10 mV, 0 to 100 mV, and 0 to 1.0 V.
- Available option: 0 to 10.0V range.
- Output conversion rates: 0.5, 1.0, 2.0, 5.0, 10.0, 20.0, and 50.0 Hz.
- MS Windows™ 3.1 based software.
- Three report options:

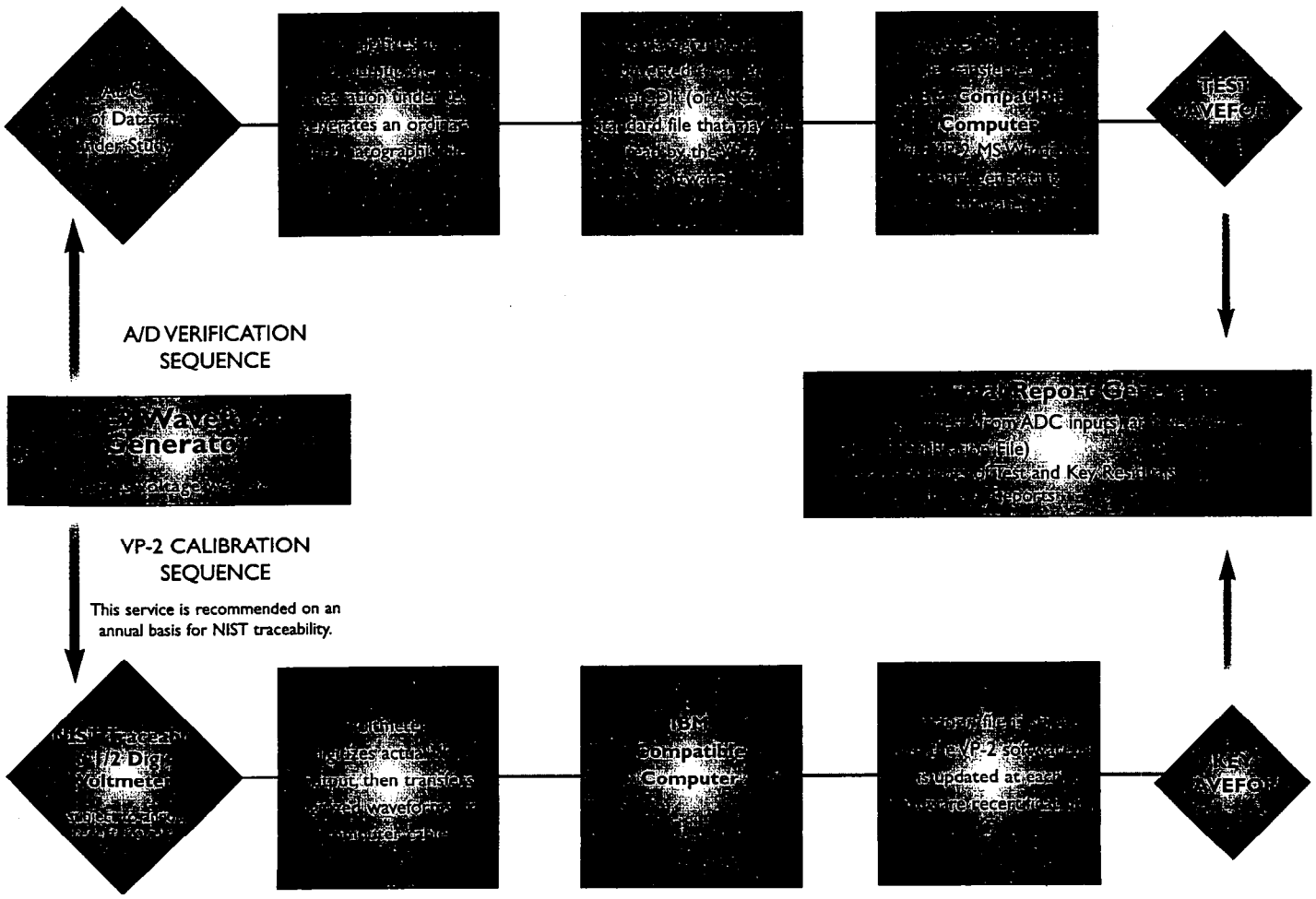
  Overlay:
  Overlays traceable VP-2 output with test waveform.

  Graph:
  Unique to each waveform, displays specific test information.

  Summary:
  Text report summary of all data.

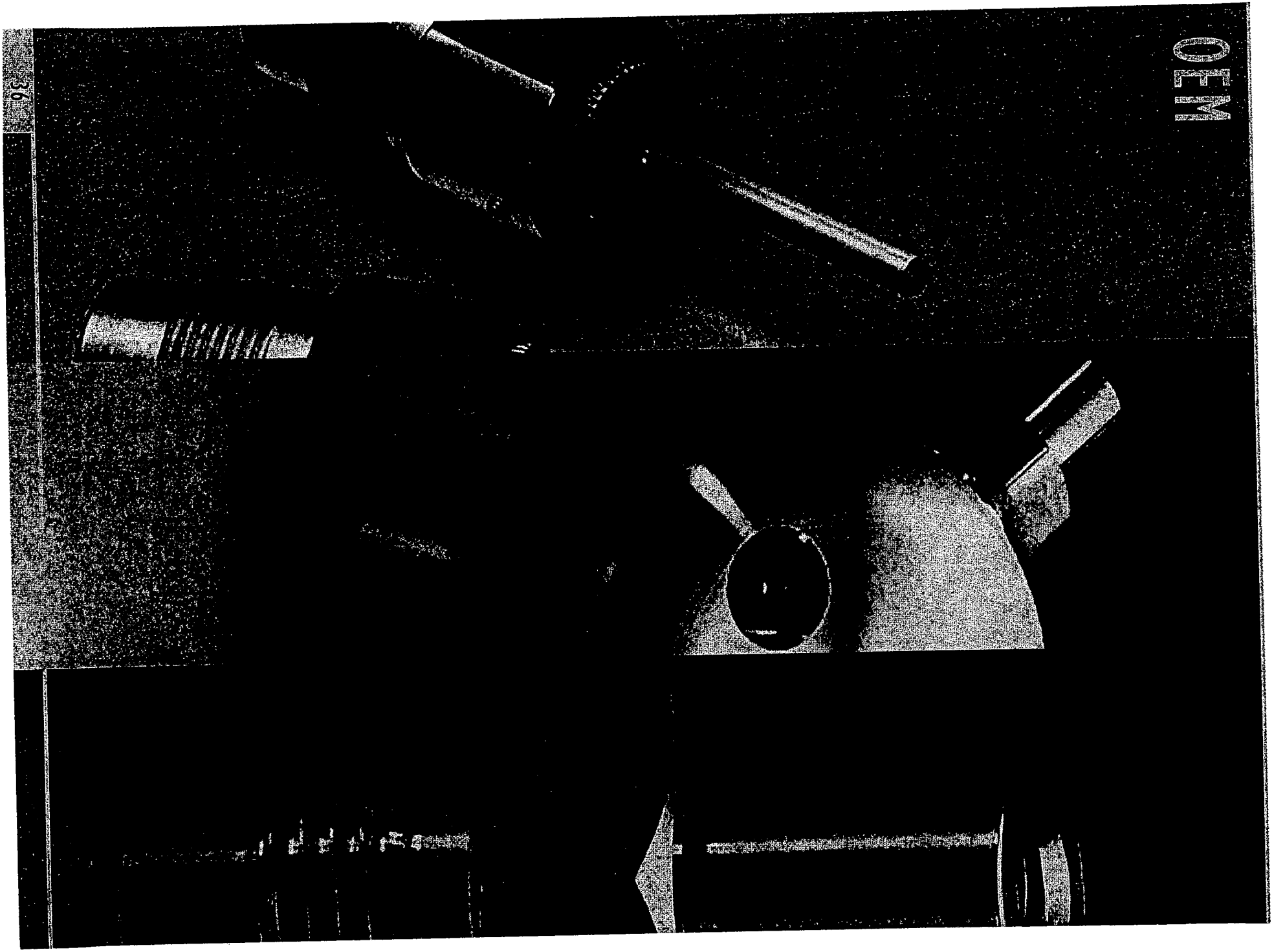
VP-2 A/D Verification System

OPTI-Part #	Description	Price
10-45-0176	VP-2 with Linearity Verification EPROM	
10-45-0177	Chromatographic EPROM	
10-45-0178	NIST Recertification with Annual Software Upgrade	



VALIDATION

OEM



Optimize Components for OEM HPLC Systems

This section of our catalog contains information about replacement HPLC components from Optimize designed specifically for OEM systems. On the next few pages, you'll find general information about products like OPTI-MAX® Cartridge Check Valves, OPTI-SEAL® piston seals, and other accessories offered for multiple OEM systems, as well as reference articles containing useful technical information on topics like periodic maintenance and check valve repair. Optimize manufactures precision-machined components for a large selection of solvent delivery systems from over 20 manufacturers. Starting on page 50, you'll find sections containing comprehensive product listings for each of these HPLC brands, organized alphabetically by manufacturer's name. Look for your brand in the table of contents on page 5, or use the EZ Locator chart below. Manufacturers' names are listed at the top of each page in the OEM section. Specific pump models are listed separately within each section, to guide you quickly to Optimize components designed specifically for your particular pump brand and model.

The Cost of Time

For your laboratory to be competitive, it must remain productive. The racks of samples lined up for analysis must make the trek from autosampler to data file smoothly and reliably, by way of your HPLC. And if your HPLC system goes down with an unexpected maintenance problem, there is one thing of which you can be sure: fixing the problem is going to cost you time and money. Replacement HPLC components can be expensive, but these costs are peanuts in relation to the cost of lost analysis time. For most productive labs, the opportunity cost of a single HPLC system sitting idle with a maintenance problem can reach into the thousands of dollars.

At Optimize, every component we manufacture is designed with an important purpose in mind: to keep your HPLC system operating at peak performance between scheduled maintenance periods. We precision-machine our OEM replacement components to the most exacting standards in the industry. Balls and seats used in our OPTI-MAX cartridge check valves are precisely matched to meet leak-test benchmarks four times more stringent than the industry standard. OPTI-SEAL and ITB™ piston seals are engineered to provide longer lifetimes and superior shedding characteristics. Replacement pistons from Optimize offer excellent concentricity and consistent surface finish. Whether you are buying a fitting, a priming valve or a complete pump head assembly from Optimize, you can always be sure that our commitment to quality and innovation is paramount.

OEM Components: The Truth of the Matter

Most instrument manufacturers will tell you quite emphatically that for optimal instrument performance, you should use only components that meet their performance specifications. At Optimize, we couldn't agree more. Every replacement component we offer is fully guaranteed to meet or exceed the specifications of the original equipment manufacturer. In fact, Optimize already produces HPLC components for several OEM manufacturers that are incorporated as original equipment on new HPLC instrumentation. Researchers and manufacturers alike are discovering that when it comes to replacement HPLC components, precision and innovation can have a very dramatic effect on the bottom line.

Your Resource for New Innovations

At Optimize, we offer a comprehensive selection of components for most brands of HPLC system, but we're always seeking new ways to bring you new products that will save your laboratory time and money. If you have a need for a product you don't see listed in this catalog, please call a technical support representative to discuss your particular fluid handling challenges.

EZ Brand Locator

Use this chart to locate the catalog section dedicated to your brand of HPLC pump.

Brand
ABI/Kratos
Beckman/Altex
Bio-Rad
Bischoff
Dionex
Gilson/Spectra
Gynkotek
Hewlett-Packard
Hitachi
Isco
Jasco
Kontron
Knauer
LDC/Milton Roy
LKB
Perkin-Elmer
Rainin
Shimadzu
Spectra-Physics
SSI
Tosoh
Varian
Waters

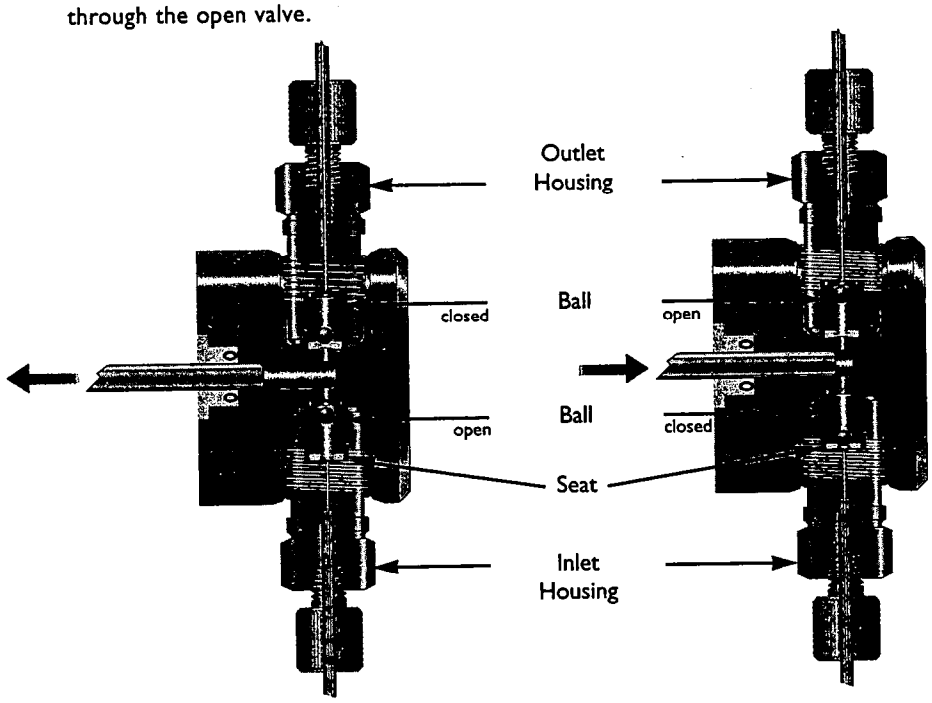
Check Valves: A Guide To Function & Maintenance

Check valve replacement is one of the most common HPLC maintenance challenges. While theoretically simple, it can become a time-consuming and frustrating service problem. Proper check valve operation is a key to reliable pump performance, and the ability to diagnose and correct check valve problems rapidly is vital to minimizing productivity loss in your laboratory.

Check Valve Operation

The mechanics of check valve operation are not complicated. Inside most check valves, a ball of a certain diameter sits freely above a seat containing a single through-hole with a diameter slightly smaller than that of the ball. Liquid should not pass the check valve in any way but through the seat. When the pressure behind the seat exceeds that above the ball, liquid flows through the valve. When the pressure above the ball exceeds the pressure below the seat, the ball returns to rest in the seat, forming a seal and preventing solvent backflow.

Most modern HPLC pumps deliver solvent at high pressure using two reciprocating pistons in series or parallel. Check valves are located in series above and below the piston, restricting flow to a single direction, usually upward. As the piston completes a delivery stroke and begins the intake stroke, the pressure inside the pump head drops. High pressure above the outlet check valve causes it to seal, while the inlet check valve opens as solvent is drawn through it and into the pump head. When the piston switches direction for the compression stroke, the pressure inside the head increases, and soon exceeds the pressure below the inlet check valve. The inlet valve seals, then the outlet opens, and solvent flows up through the open valve.



Intake Stroke

Delivery Stroke

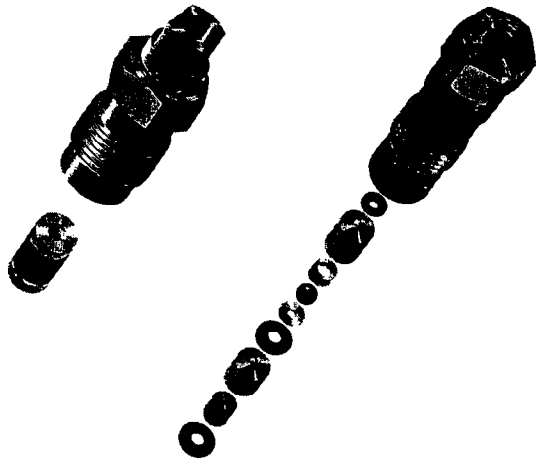
Numerous factors determine how effectively and reliably a check valve will perform. First and foremost, it is the integrity of the seal made between ball and seat that defines a check valve's performance. Other factors such as the weight of the ball and the amount of travel it is allowed within the valve affect the response time of the valve. Check valves must seal rapidly in response to pressure changes if pump pulsation is to be minimized, but the amount of ball travel allowed must be sufficient to allow unrestricted solvent flow through the valve.

Weighing Your Options

Cartridge-based check valve systems are by far the most convenient and reliable means of check valve replacement. Pre-assembled check valve cartridges are inserted into a reusable housing, giving you the economy of a rebuild kit without the substantial risk of contamination. Our OPTI-MAX® Cartridge Check Valve System is the most versatile and durable cartridge-based replacement check valve system available. Cartridges are available in several configurations, loaded with precision-matched ball & seat sets leak-tested to the tightest specifications in the industry. A single OPTI-MAX cartridge fits OPTI-MAX inlet and outlet housings for multiple pump brands, so you can keep your check valve inventory to a minimum.

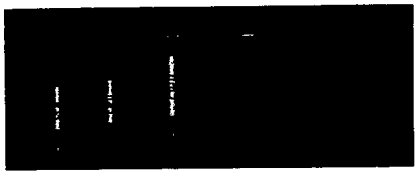
The modular nature of cartridge-based replacement check valve systems has allowed for greater flexibility in the selection of materials used for balls, seats and cartridge bodies. Check valves containing ruby balls and sapphire seats continue to be a popular choice for HPLC users, but ceramic ball and seat sets have been steadily gaining acceptance. Because ceramic has a density 1.5 times that of ruby, the heavier ceramic ball should seat more rapidly, improving check valve performance for some applications. OPTI-MAX check valve cartridges are available with balls and seats made from ceramic or ruby/sapphire, loaded into PEEK or stainless steel cartridge bodies. For general use, stainless steel cartridges offer excellent solvent compatibility and mechanical strength, and are an excellent choice for most HPLC applications. For biocompatible HPLC systems, PEEK cartridges provide a completely bio-inert flowpath when used with PEEK OPTI-MAX housings. When bio-inertness is a requirement, we recommend PEEK cartridges with ceramic balls and seats. Look for our cartridge type recommendations in the Cartridge Code Charts within each OEM manufacturer's section. For more information about OPTI-MAX cartridge check valves, please refer to page 40.

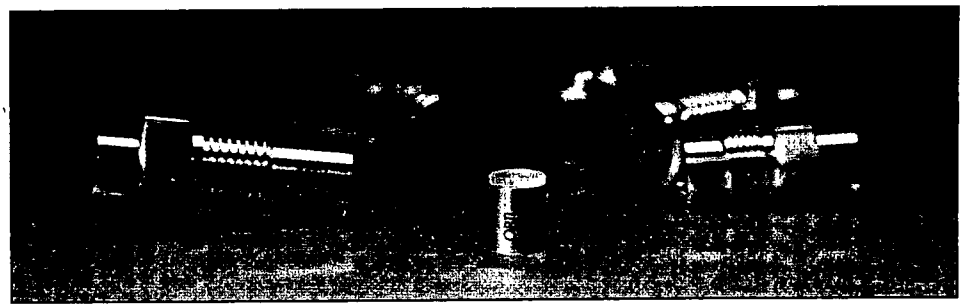
For those who prefer to rebuild their own check valves or purchase complete pre-tested check valve assemblies, Optimize offers direct OEM replacement check valves and rebuild kits for a variety of manufacturers' HPLC pumps. If you choose to rebuild check valves yourself, minimize the chance of contamination by performing the rebuild procedure in a clean and dust-free environment.



Check Valves can be replaced using cartridge-based systems (left)
or pretested assemblies and rebuild kits (right)

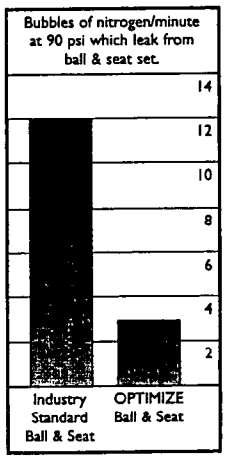
OPTI-MAX®





FEATURES

- Cost efficient. Cartridges eliminate many components used in conventional check valves. Interchangeable cartridges reduce inventory.
- Simple to use. Rebuild check valves by dropping a cartridge into the housing.
- One cartridge fits multiple brand housings.
- PEEK and SS cartridges are available for standard, microbore and extended flow applications.
- 100% tested.
- Clean-room assembled.
- Custom designed housings provide best fit and easy installation.
- Reduced pulsation due to a precise and low amount of ball travel: 2 -3 times less than typical industry standards.
- The balls and seats used in OPTI-MAX® cartridges must pass the Nitrogen leak test to a standard four times more stringent than that specified by most other manufacturers.



OPTI-MAX® Cartridge Check Valve System

One thing you can be sure of in HPLC is that the check valves in your pump will eventually need to be replaced. Your options for check valve replacement are numerous, but comparing these options can be difficult, as features, specifications, materials, and performance claims can vary greatly with each manufacturer. Fortunately, you only need to be sure of two things when choosing a replacement check valve system for your laboratory. First, you need a system that lets you replace check valves quickly and easily. Second, you need a check valve that is going to perform reliably and consistently between scheduled maintenance periods.

The OPTI-MAX Cartridge Check Valve System from Optimize is designed to offer maximal performance and ease of use. Every aspect of design and manufacture, from the sharp, consistent threads on OPTI-MAX custom housings, to the exacting standards required of the matched balls and seats used in OPTI-MAX cartridges, is tightly controlled for a single reason: when it comes to reliable check valve operation, quality and precision make a big difference.

OPTI-MAX Cartridges: A Universal Solution

A single OPTI-MAX cartridge is interchangeable across multiple pump brands, and will function in either the inlet or outlet position. The same cartridge will fit into pumps made by Shimadzu, Waters, Hitachi, and most other OEM solvent delivery systems, allowing you to minimize the number of spare check valve cartridges in your inventory. OPTI-MAX Cartridges are available in PEEK or stainless steel, loaded with precision-matched ball and seat sets in ceramic or ruby/sapphire. Three ball/seat sizes are available, providing optimal performance for microbore, standard and extended flow applications.

The performance of a check valve can only be as good as the integrity of the seal made between the ball and seat inside it. All ball and seat sets used in OPTI-MAX cartridges are precision-matched to the most exacting standards in the industry, and must pass Nitrogen leak tests four times more stringent than those specified by most other manufacturers.

Free-Turn™ Housings: An Optimize Innovation

Most OPTI-MAX check valve housings for OEM systems now incorporate a Free-Turn feature. This time-saving innovation lets the external housing thread twist independently of the tubing port, allowing you to remove OPTI-MAX housings from your pump head without first disconnecting the attached tubing. This simple design improvement will shave minutes off the time required to replace a check valve cartridge, and will prolong the life of your polymeric tubing and fittings by minimizing damage and wear caused by their repeated removal and retightening.

EZ OPTI-MAX® Locator

Brand	Page #	Brand	Page #	Brand	Page #	Brand	Page #
ABI/Kratos		Gilson/Rainin		Jasco		Shimadzu	
Beckman/Alp		Gynkotek		Kontron		Spectra Physics	
Bio-Rad		Hewlett-Packard		LDC/Milton Roy		SSI	
Bischoff		Hitachi		LKB		Varian	
Dionex		Isco		Perkin-Elmer		Waters	

Use this chart to locate OPTI-MAX Cartridge Check Valves for your HPLC pump.

40

OPTIMIZE TECHNOLOGIES For Technical Support Call 800-669-9015

OPTI-MAX®

OPTI-MAX® Cartridge Check Valves: Using the Cartridge Code

When you order the OPTI-MAX Cartridge Check Valve System for your HPLC pump, you have a choice of cartridge and ball/seat materials. OPTI-MAX Cartridges are available in both stainless steel (SS) and PEEK, and are loaded with precision-matched sets of ceramic or ruby/sapphire balls and seats. You can easily select the type of cartridge you need using the Cartridge Code Chart that appears next to every OPTI-MAX product listing in the brand-specific sections of this catalog. For more information on selecting cartridge and ball/seat materials, refer to page 39.

Part numbers for OPTI-MAX products throughout this catalog contain a middle set of digits called the Cartridge Code, that you can use to specify the type of cartridge you need. When you see a part number such as 34-●-00902, simply follow the blue arrow behind the ● symbol to a set of codes corresponding to your OPTI-MAX cartridge choices. Find the two-digit code that matches your preferred cartridge type, and substitute that number for ● to produce the part number you need. There may be more than one set of codes listed in a single table, so be sure to follow the arrow from your instrument section to the correct set of codes for that instrument.

To demonstrate the OPTI-MAX Cartridge Code ordering system, we'll build some example part numbers using the OPTI-MAX ordering guide below.

SAMPLE TABLE

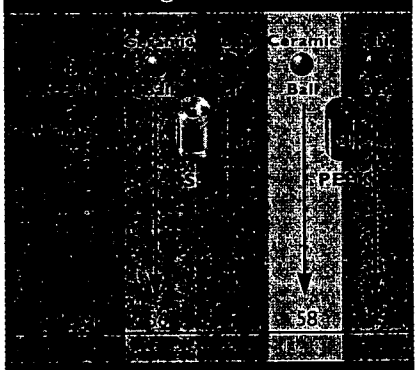
OPTI-MAX® Cartridge Check Valves

Shimadzu LC-6A, LC-10AS FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
INLET	34-●-00902	OPTI-MAX Inlet Housing & Cartridge	228-12353-91	$
OUTLET	34-●-00907	OPTI-MAX Outlet Housing & Cartridge	228-09054-93	
CARTRIDGE	10-●-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk		

Recommended Cartridge

OPTI-MAX Cartridge Code Chart



We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to your left. See page 41 for more information.

If you have a Shimadzu LC-10AS pump and wish to order stainless steel replacement cartridges with ceramic balls and seats, follow the blue arrow behind the cartridge code symbol ● to the group of four Cartridge Codes listed for this Shimadzu system. The correct choice for a stainless steel/ceramic OPTI-MAX cartridge is 56. By substituting this code for ● in the part number for replacement OPTI-MAX cartridges, you get 10-56-02004.

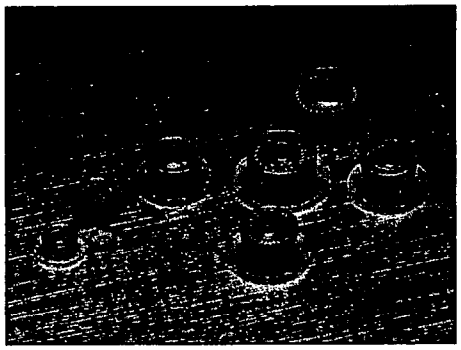
If you need to order an inlet housing with a PEEK/ceramic OPTI-MAX cartridge, the procedure is the same. The Cartridge Code Chart indicates that the ● for this OPTI-MAX cartridge is 58. The correct part number (34-58-00902) is found by substituting 58 for ● in the part number listed for an inlet housing and cartridge.

For each pump brand and model, we recommend use of a particular OPTI-MAX cartridge. Be sure to look for recommended cartridges highlighted within each Cartridge Code Chart. If you have questions about finding the correct part number for the OPTI-MAX cartridge you require, please call our Technical Support Department.

Selecting A Piston Seal For Your Application

Today's HPLC methodologies can require a variety of mobile phase constituents, delivered over a range of operating temperatures and using unique solvent delivery parameters. When selecting a piston seal for your HPLC system, you should always take into consideration the operating conditions required for your particular application.

Optimize manufactures replacement piston seals using either of two long-lasting, versatile polymer-based materials, specifically formulated to provide longer seal lifetimes and superior wear characteristics. Our OPTI-SEAL® pump seals are machined from OS-10.1™, a proprietary UHMW-Polyethylene blend. We also offer ITB™ (Improved Teflon® Blend) seals, made from a proprietary PTFE-based material.



Selecting A Seal: Chemical & Mechanical Considerations

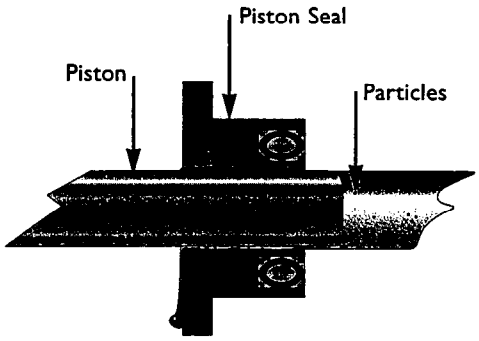
So which seal works best for what? Selecting the best seal for the application is fairly easy, providing you know what to consider. While other variables play a role, the composition of your mobile phase will be the primary factor in determining which pump seal will work best for your application. UHMW-Polyethylene pump seals will typically yield longer lifetimes than PTFE seals under wholly or mostly aqueous conditions; the UHMW-PE polymer is a harder material than PTFE, and is much more resistant to abrasion. Conversely, PTFE performs well in mobile phases that are more strongly organic in composition. Because it is softer, PTFE will also be more likely to conform to a plunger that is worn or has flat spots, or one that is misaligned or out-of-round. Plungers that show visible signs of wear and/or damage should be replaced as soon as possible, however, as they will cause accelerated wear of the plunger seal. Any savings realized by continued use of a damaged plunger will be more than offset by increased seal consumption and an overall increase in instrument maintenance and downtime.

A second consideration is that of solvent compatibility. PTFE is impervious to almost all common HPLC solvents, but a select few mobile phase constituents can be a problem. Likewise, polyethylene exhibits excellent overall solvent resistivity characteristics, but is susceptible to attack by certain organic solvents and strong oxidizing agents. For more specific information on seal material-solvent compatibilities, please refer to the table on page 8.

Seal Shedding: Avoiding Problems with Particulates

It's an unavoidable fact: by design, the piston seals in your HPLC pump are subject to wear, and will eventually contribute in some degree to particulate contamination in your mobile phase. Obviously, the trapping and removal of these seal shedding particulates via in-line filtration is a vital precaution. At Optimize, we also address seal shedding problems well in advance of the moment you place a new seal in your pump head. We incorporate optimal system protection by design, by paying careful attention to the shedding characteristics of the polymers used in the manufacture of our OPTI-SEAL and ITB piston seals.

As a PTFE-based seal wears, small particles of PTFE and graphite filler are sloughed off from the internal seal wall, and swept into the mobile phase. Many original equipment seals can shed particulates as small as 0.5 micron, and smaller. Particles of this size can be especially problematic for your HPLC system, as they will either pass through or rapidly block 2 micron in-line filter and column end frits. Our ITB polymer has been specifically formulated to shed particles large enough to be trapped at the surface of a 2 µm frit, allowing more reliable filtration of shedding particulates, and minimization of back-pressure problems due to frit clogging.



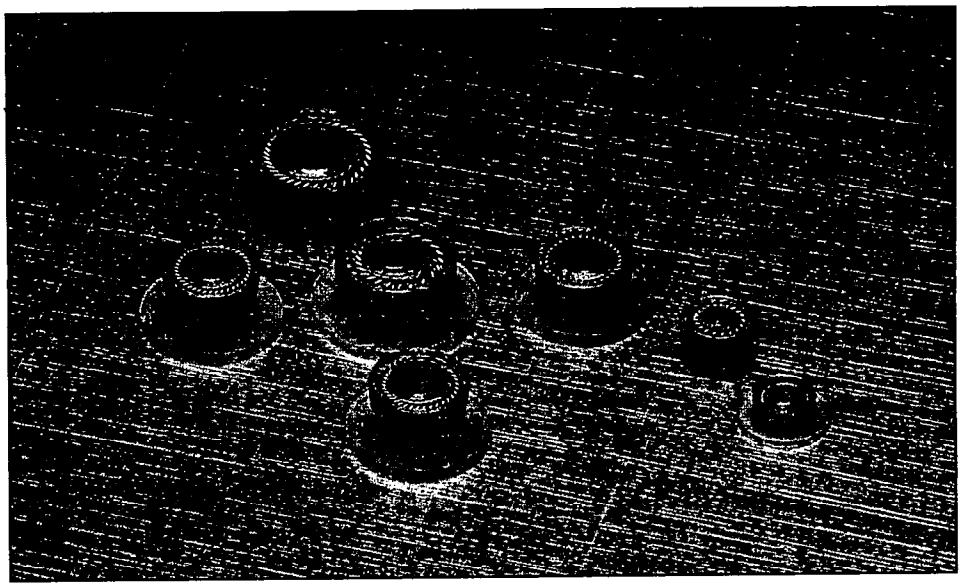
The OS-10.1 UHMW-PE blend used in our OPTI-SEAL piston seals is five to ten times more resistant to wear than typical PTFE-blend seals, and offers drastically reduced shedding under mostly or wholly aqueous or buffered-aqueous conditions. Also, since the OS-10.1 material is a homogeneous polymer, any particulates that might shed from an OPTI-SEAL will tend to be stringy fibers that do not cause complete frit blockage.

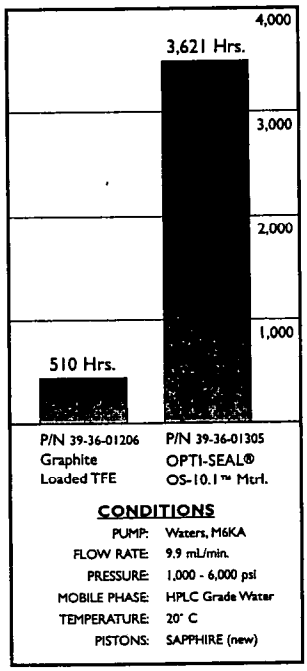
Making Your Selection

As the best choice of seal material ultimately depends on the composition of your mobile phase, then you already have most of the information you need to make a decision. In short, both UHMW-PE and PTFE-based seals will perform well across the mobile phase spectrum. The superior wear characteristics of UHMW-PE will be most dramatic in reverse phase applications where aqueous or mostly aqueous mobile phases are used. In situations where a high percentage of strong organic solvents are required, or where the seals will be operated at high temperatures, a PTFE seal is the better choice. If you use multiple HPLC systems and run a variety of mobile phases, it can be beneficial to dedicate systems to specific applications according to mobile phase requirements. By reserving an adequate number of instruments specifically for applications requiring high organic content mobile phases, you can limit your PTFE seal usage to these systems, and equip your other HPLC instruments with longer-lasting polyethylene seals.

For additional information on solvent compatibilities, or for a specific seal recommendation based on your operating conditions, please contact our Technical Support Department.

PUMP SEALS





Replacement Pump Seals From Optimize

Replacement pump seals from Optimize are the seal of choice for longer lifetimes and superior wear characteristics. Available for most OEM analytical HPLC systems, Optimize pump seals are precision-machined from either of two polymer-based materials. An exclusive UHMW-PE blend is used for OPTI-SEAL® pump seals, and our ITB™ (Improved Teflon® Blend) pump seals are machined from a PTFE-based material. The polymer blends used in Optimize seals are carefully selected to provide optimal shedding characteristics and reduced friction, and to be completely free of extractables that might otherwise interfere with your analysis.

OPTI-SEAL: Superb Performance in Aqueous Conditions

OPTI-SEAL pump seals from Optimize are the longest-lasting seal you can buy for use in mostly aqueous or aqueous-buffered mobile phases. Made from OS-10.1™, a proprietary UHMW-PE-based material, OPTI-SEAL pump seals are much more resistant to wear than traditional PTFE-based seals, and can last up to seven times longer than traditional seals under mostly aqueous conditions. The OS-10.1 polymer is optimized for HPLC sealing applications. It has a coefficient of friction approaching that of Teflon, thanks to special additives that reduce friction between the seal and the piston surface but do not contribute extractable contaminants. Because the UHMW-PE blend is a homogeneous polymer, it also exhibits superior shedding characteristics. Overall shedding is minimized due to increased resistance to wear, and the particles that are shed tend to be long, stringy fibers that are less likely to clog frits or tubing.

EZ OPTI-SEAL® Locator

ABI/K-Tek	Cynitotal	LDC/Milton Roy	SSI
Accom/Varian	Dowlex/Kor	LKB	Thermo
Bio-Rad	Fisher	Perkin-Elmer	Varian
Bischoff	Foxboro	Reinin	Waters
Dionex	Hasco	Shimadzu/ESA	Wyatt
Gilson/Rainin	Knauer	Spectra-Physics	

PUMP SEALS

Improved Teflon® Blend™: Optimal Performance By Design

ITB pump seals are a superior choice to most OEM graphitized-carbon/Teflon seals. Our proprietary PTFE-based Improved Teflon Blend (ITB™) polymer is designed to shed particles large enough to be trapped at the surface of a 2 µm frit. Many OEM PTFE-based seals shed particles as small as 0.5 micron; particles of this size have the greatest potential for causing frit blockages, leading to increased back-pressure. ITB seals are excellent for applications requiring elevated temperatures or mobile phases with high organic content. The ITB polymer exhibits broad compatibility with most HPLC solvents. PTFE-based seals tend to be softer than those made from UHMW-PE, and will more likely maintain a seal at high pressure in situations where piston side-loading or misalignment occurs; they will also conform more readily to a worn piston.

A Multi-Seal Strategy

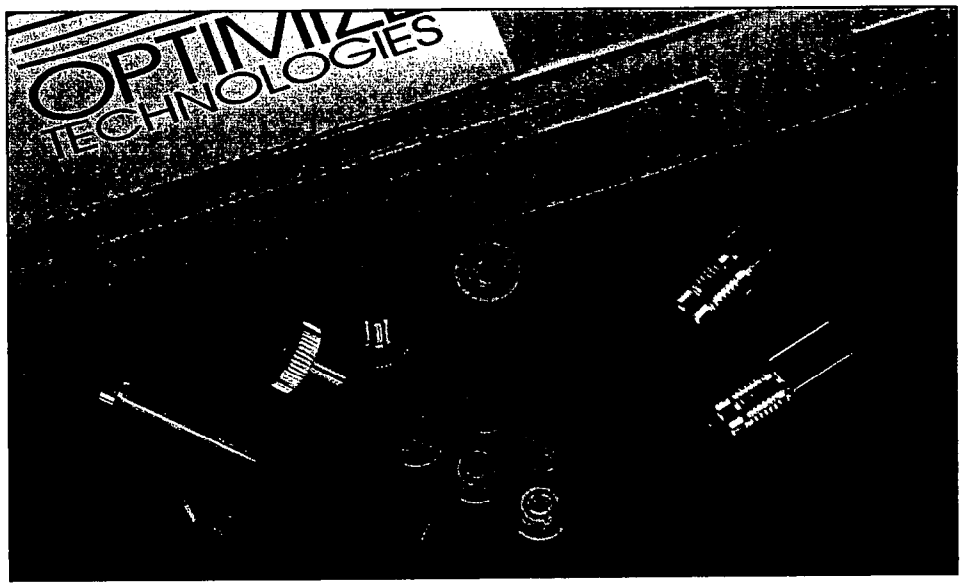
It can be very beneficial to keep both OPTI-SEAL® and ITB pump seals on hand in your laboratory. Seal lifetimes can be maximized by using OPTI-SEAL for mostly aqueous-based applications, and switching to ITB for applications that employ higher amounts of organic solvents. This multiple seal strategy can be even more effective if you have several HPLC systems available. By dedicating certain systems for applications where PTFE-based seals are required, the remainder of your HPLCs can be equipped with OPTI-SEAL for maximum seal lifetime and minimal shedding.

OPTI-SEAL and ITB pump seals are available for a wide selection of HPLC pump brands and models. For more information on Optimize pump seals for your type of pump, please use the EZ Locator Chart below to find the page number corresponding to your pump manufacturer. For more information on selecting the best seal for your application, please refer to page 42, or call Technical Support at 800-669-9015.

EZ ITB™ PTFE Pump Seal Locator

Brand	Page	Brand	Page	Brand	Page	Brand	Page
ABI/Kratos	[illegible]	Gynkotek	[illegible]	LDC/Milton Roy	[illegible]	SSI	[illegible]
Beckman/Altex	[illegible]	Hewlett-Packard	[illegible]	LKB	[illegible]	Tracor	[illegible]
Bio-Rad	[illegible]	Hitachi	[illegible]	Perkin Elmer	[illegible]	Varian	[illegible]
Bischoff	[illegible]	Isco	[illegible]	Rainin	[illegible]	Waters	[illegible]
Dionex	[illegible]	Jasco	[illegible]	Shimadzu/ESA	[illegible]	[illegible]	[illegible]
Gilson/Rainin	[illegible]	Knauer	[illegible]	Spectra-Physics	[illegible]	[illegible]	[illegible]

HPLC FIRST AID KITS™



To minimize HPLC system down-time, you must be prepared for unexpected maintenance problems. Whether you maintain your own HPLC pump or call a service professional, you need to have rapid access to vital system components, so that you can fix the problem quickly and get back to your chromatography.

HPLC First Aid Kits™ from Optimize are an excellent way to keep minor component failures from becoming a major problem. They contain a useful selection of replacement parts, all in a single kit specifically tailored to your HPLC pump. Each kit also includes an inventory list and order form for convenient kit restocking, as well as a recommended stocking list for your brand and model of pump. A fully-stocked HPLC First Aid Kit stored nearby your system will equip you with every component you need to remedy most common pump problems as soon as they occur.

HPLC First Aid Kits Include:

- OPTI-MAX® Inlet Housing/Cartridge Check Valve
- OPTI-MAX Outlet Housing/Cartridge Check Valve
- OPTI-MAX Replacement Cartridge Check Valves (2/pk)
- OPTI-SEAL® UHMW-PE Pump Seals (5)
- OPTI-LOK™ 6K SS Nuts/Double Tight Ferrules (2 of each)
- Optimize Solvent Reservoir Filter
- Piston

Pricing and part numbers for HPLC First Aid Kits are listed within each of the OEM manufacturer sections of this catalog. Use the EZ Locator chart below to find the page number corresponding to your brand of pump:

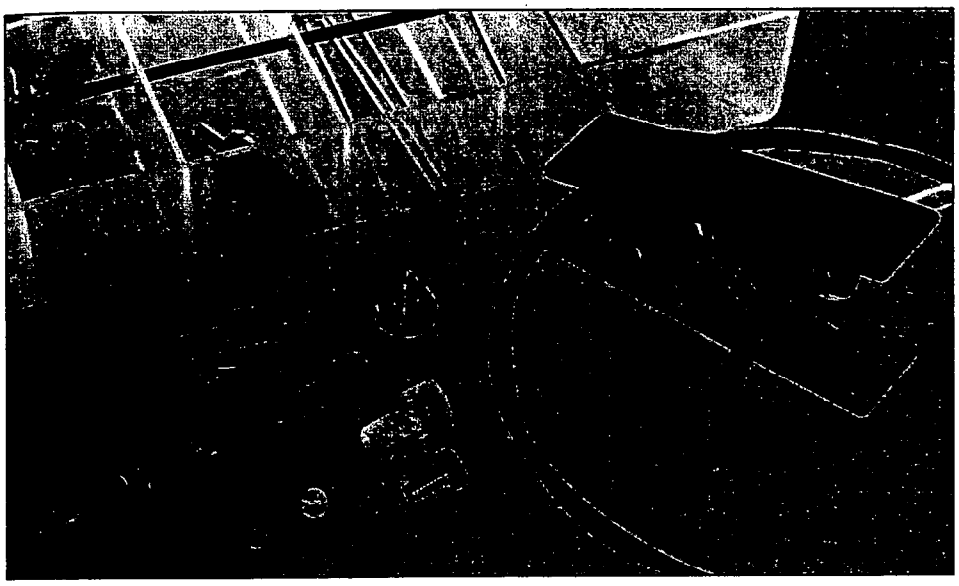
EZ HPLC First Aid Kit™ Locator

[illegible]	[illegible]	[illegible]	[illegible]
ABI/[illegible]	Gilson/[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
Dionex	Jasco	[illegible]	[illegible]

Individual components may vary according to pump brand and model. For complete information on kit contents for your HPLC pump, please call a technical support representative.

ACCESSORY KITS

HPLC FITTINGS KITS



HPLC Fittings Kits from Optimize contain a useful selection of our precision-machined fittings, tubing and other accessories, specifically tailored for the connection requirements of your HPLC system. To locate the best kit for your HPLC brand and model, use the EZ Locator Chart at the bottom of this page. We also offer Universal HPLC Fittings Kits containing fittings and tubing for making common connections on multiple HPLC systems.

Pricing and part numbers for HPLC Fittings Kits are listed separately within each of the OEM manufacturer sections of this catalog. Use this EZ Locator chart below to find the page number corresponding to your brand of pump:

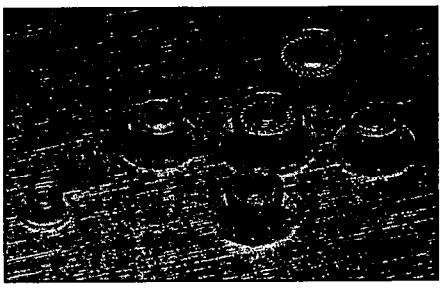
EZ HPLC Fittings Kit Locator

Brand	Brand	Brand	Brand
ABI/K	Gilson/Rainin	DC/Milton Roy	Spectra Physics
Beckman	Gynkotek	KBM	SSI
Bio-Rad	Hewlett-Packard	Perkin-Elmer	Varian
Bischoff	Hitachi	Rainin	Waters
Dionex	Jasco	Shimadzu	

Individual components may vary according to pump brand and model. For complete information on kit contents for your HPLC pump, please call a technical support representative.

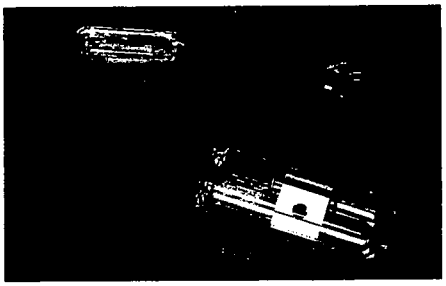
Better Performance Through Periodic Maintenance

As with most analytical instruments, HPLC systems require periodic maintenance if they are to perform optimally. There are two basic approaches to maintenance of an HPLC system; some laboratories may choose to establish a specific schedule for replacement of key system components, while others might employ a "fix it when it breaks" philosophy. The ultimate goal of any effective maintenance plan should be to minimize instrument down-time wherever possible. Implementation of a regular, periodic maintenance plan is the best way to achieve this goal, and can also play an important role in meeting regulatory compliance guidelines. Outlined below are recommended maintenance schedules for some commonly replaced HPLC system components. These schedules can be used as general guidelines to assist you in implementing a periodic maintenance schedule for your HPLC system(s), but can be adjusted based on your experience with maintenance cycles in your laboratory, in order to more closely match your operational conditions.



Piston Seals

No other wetted component within a typical HPLC system experiences as much direct wear as the piston seal. The average lifetime of a piston seal will vary somewhat depending upon related parameters, such as the seal material, the composition of the mobile phase, the presence of particulates or precipitated salts around the seal, and the condition of the piston itself. Most laboratory P.M. schedules call for replacement of the piston seal on a quarterly or semi-annual basis. In general, the piston seal should be replaced at least once every six months, providing there is no excessive and unusual wear due to the factors listed. Where conditions are less than optimal, more frequent replacement will likely be required.



UV Detectors

For UV detectors, source lamps are the most common consumable item requiring routine replacement. The frequency of replacement will vary depending upon the amount of usage, but it can be estimated based upon the frequency of use and the anticipated lifetime of the lamp. Typically, source lamps will require replacement annually or semi-annually.

Pistons

The pistons inside an HPLC pump typically do not require routine replacement, but they too are subject to wear, and should be inspected as part of the P.M. schedule. They should be examined at least once a year, and preferably whenever the seal is replaced. Close examination of the surface finish can reveal potential problems such as flat spots, out-of-roundness, adhered particulates or buffer salts, scratches and cracks. Light microscopes can be useful for inspecting the condition of a piston. Particular attention should be paid to the piston when UHMW-PE seals are to be installed in place of PTFE-based seals. UHMW-PE provides considerably longer seal lifetimes when used with mostly aqueous mobile phases, but the PE material is less forgiving than the softer PTFE blend. A worn or damaged piston that performs adequately with a PTFE seal may cause problems with UHMW-PE. When switching to UHMW-PE seals after using PTFE, it is usually a good idea to replace the piston at the same time.

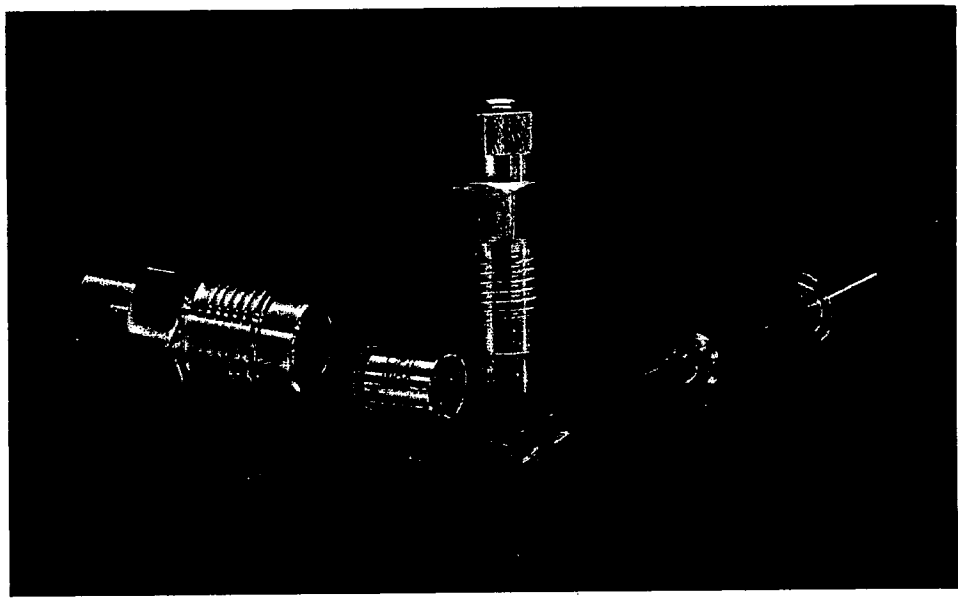
Check Valves

As with piston seals, the lifetime of a check valve will vary depending upon chromatographic conditions. The ball and seat are subject to wear, and the ball may also become coated with particulates or other matter, causing sealing problems. The majority of laboratories routinely replace check valves every six months. Once again, longer or shorter lifetimes may be the norm in your laboratory, and the frequency of replacement may require some adjustment. When replacing check valves, both complete rebuild kits and replacement cartridge check valves are viable options. Of these, cartridge-based systems are usually the preferable choice, due to greater convenience and reliability, and reduced risk of contamination during installation.

Autosampler or Injection Valve

For most sample injection devices, the only components that require regular replacement are rotor seals and liquid seals. This can usually be performed on an annual basis.

ABI/KRATOS



OPTI-MAX® Cartridge Check Valve System and Piston for ABI/Kratos

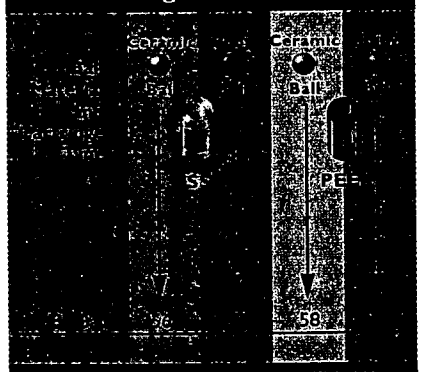
For maximum performance and proven reliability, choose OPTI-MAX Cartridge Check Valves for your ABI/Kratos HPLC system. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom-designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one. Innovative Free-Turn™ housings let you switch cartridges without removing your connecting tubing.

OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See page 41 for more information.

Recommended Cartridge

OPTI-MAX Cartridge Code Chart



We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the right. See page 41 for more information.

OPTI-MAX® Cartridge Check Valves

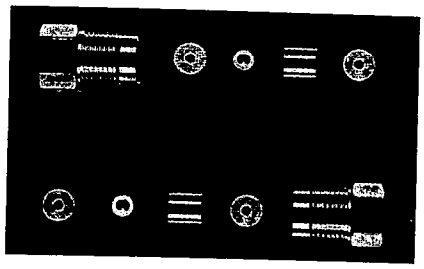
ABI/Kratos Spectraflow 400 FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
INLET	21[illegible]00451	OPTI-MAX Inlet Housing & Cartridge	7200-0060	
OUTLET	21[illegible]00460	OPTI-MAX Outlet Housing & Cartridge	7200-0062	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk.		

number from this chart to select the cartridge type you need.

For those who prefer purchasing standard check valve assemblies or repairing check valves with rebuild kits, we offer these precision-machined replacement parts, guaranteed to meet or exceed OEM specifications.

Standard Check Valves

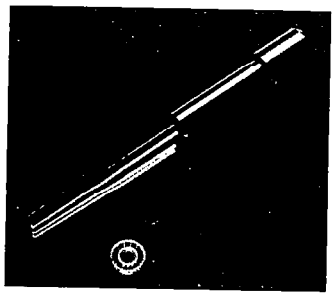


ABI/Kratos Spectraflow 400

Type	OPTI-Part #	Description	OEM #	Price
INLET	21-38-00442	Tested Inlet 1/8"	7200-0060	
OUTLET	21-38-00447	Tested Outlet 1/8"	7200-0062	
REBUILD	21-38-00449	Rebuild Kit, 1/8" (Rebuilds 2)		
REBUILD	21-38-00450	Rebuild Kit, 1/16" (Rebuilds 2)		

Replacement seals and pistons from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.

Seals and Pistons



ABI/Kratos Spectraflow 400

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
PISTON	21-31-00494	Sapphire Piston	1400-1970	

Don't let unexpected pump malfunctions catch you by surprise! Optimize offers HPLC First Aid Kits™ equipped with a complete set of precision components for your ABI/Kratos pump, giving you rapid access to the parts you need to keep your system running. We also offer Fittings Kits which contain a useful selection of fittings, unions and plugs, value-priced and specifically tailored to your HPLC pump. See pages 46-47 for more information about accessory kits from Optimize.

For your convenience, we offer these replacement lamps for your UV detector, which are guaranteed to meet or exceed original manufacturer's specifications.

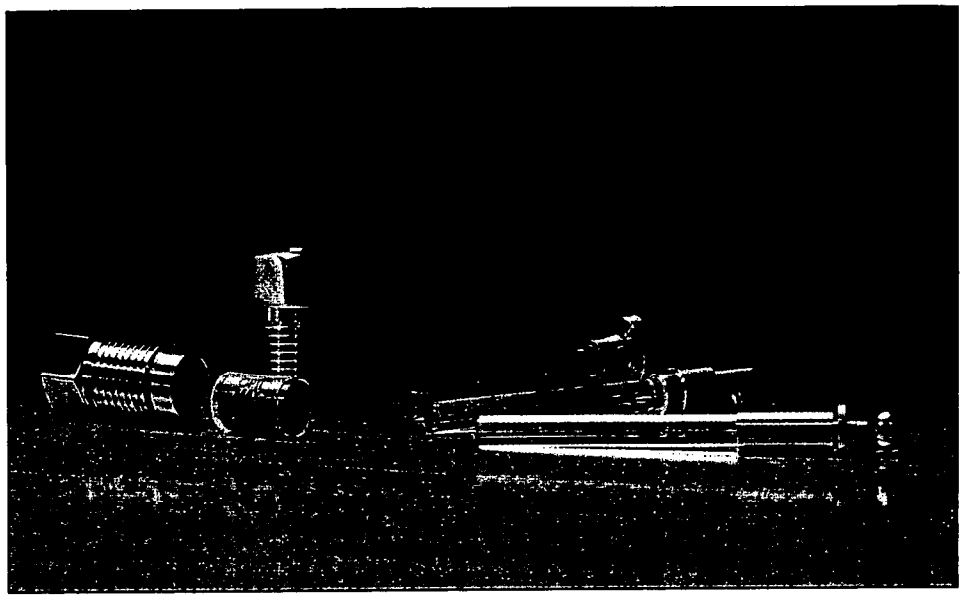
Accessory Kits and Lamps

Fittings Kit

ABI/Kratos Spectraflow 400

Type	OPTI-Part #	Description	OEM #	Price
1st AID KIT	21-08-00433	HPLC First Aid Kit, Spectraflow 400		
FIT KIT	21-08-00432	Fittings Kit, All ABI/Kratos		
LAMP	21-32-01294	Lamp, FS-970 Detector	2900-0489	

BECKMAN/ALTEX



OPTI-MAX® Cartridge Check Valve System and Pistons for Beckman/Altex

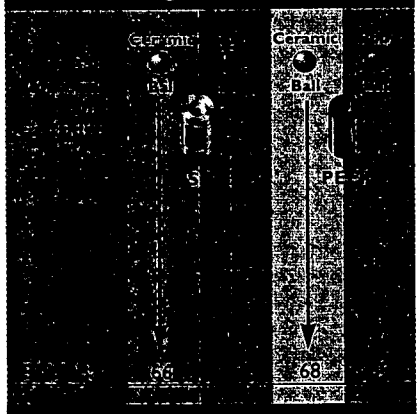
For maximum performance and proven reliability, choose OPTI-MAX Cartridge Check Valves for your Beckman/Altex HPLC system. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom-designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one. Innovative Free-Turn™ housings let you switch cartridges without removing your connecting tubing.

OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See page 41 for more information.

Recommended Cartridge

OPTI-MAX Cartridge Code Chart



We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the right. See page 41 for more information.

OPTI-MAX® Cartridge Check Valves

Beckman 100A, 110A/110B, 112/112M, 114/114M, 116, 118, 125, 126, 127, 128 FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
INLET	22[illegible]00516	OPTI-MAX Inlet Housing & Cartridge	240720	
OUTLET	22[illegible]00520	OPTI-MAX Outlet Housing & Cartridge	240721	
CARTRIDGE	10[illegible]02005	OPTI-MAX Replacement Cartridges, 3/16" Ball, 2/Pk		

[illegible] number from this chart to select the cartridge type you need.

Finding Parts for Beckman System Gold

[illegible] and then locate it in the model listings found throughout this section.

For those who prefer purchasing standard check valve assemblies or repairing check valves with rebuild kits, we offer these precision-machined replacement parts, guaranteed to meet or exceed OEM specifications.

Standard Check Valves

100A,110A/110B

Type	OPTI-Part #	Description	OEM #	Price
INLET	22-38-00503	Tested Inlet (Old Style)	243054	
REBUILD	22-38-00506	Rebuild Kit (Rebuilds 1) – "★" parts included		
	22-38-00509	Inlet Housing		
★	22-38-00510	Washer Seal	243711	
★	22-38-01319	3/16" Ball & Seat	243712	
	22-38-00511	3/16" Ball Retainer		
★	22-38-01323	Pump Head Washer, Kel-F	243091	

Tested Inlet Check Valve (Old Style)

112/112M, 114/114M, 116, 118, 125, 126, 127, 128

Type	OPTI-Part #	Description	OEM #	Price
INLET	22-38-00504	Tested Inlet (Old Style)	243038	
REBUILD	22-38-00507	Rebuild Kit (Rebuilds 1) – "★" parts included		
	22-38-00508	Inlet Housing		
★(2)	22-38-01318	Kel-F Washer, Inside	244187	
★(2)	22-38-01310	3 mm Ball/Seat	243659	
	22-38-00512	3 mm Ball Retainer		
★	22-38-00513	Kel-F Washer, Outside	243658	

Tested Inlet Check Valve (Old Style)

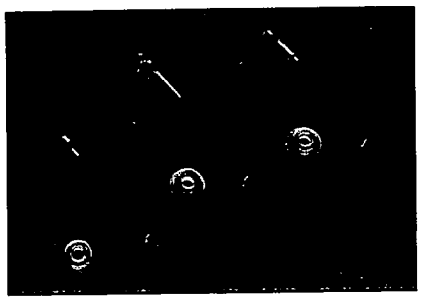
100A, 110A/B, 112/112M, 114/114M. 116, 118, 125, 126, 127, 128

Type	OPTI-Part #	Description	OEM #	Price
OUTLET	22-38-00505	Tested Outlet (Old Style)	243040	
REBUILD	22-38-00502	Rebuild Kit (Rebuilds 1) – "★" parts included		
★	22-38-00514	Frit Filter	243067	
★(2)	22-38-01310	3 mm Ball/Seat	243659	
	22-38-00512	3 mm Ball Retainer		
★(2)	22-38-01318	Kel-F Washer, Inside	244187	
	22-38-00515	Outlet Housing		

Tested Outlet Check Valve (Old Style)

BECKMAN/ALTEX

Replacement seals and pistons from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.



Seals and Pistons for Beckman/Altex Pumps

Seals and Pistons

Beckman, 100A, 110A/110B

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ITB	22-36-00492	ITB PTFE Piston Seal	887139	[illegible]
ITB 10/Pk	22-36-00493	ITB PTFE Piston Seal 10/Pk	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
TOOL	22-10-00474	Seal Forming Tool	[illegible]	[illegible]

Beckman 105, 110 Prep

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ITB	22-36-00486	ITB PTFE Piston Seal	887139	[illegible]
ITB 10/Pk	22-36-00487	ITB PTFE Piston Seal 10/Pk	[illegible]	[illegible]

Beckman 112/112M

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ITB	22-36-00494	ITB PTFE Piston Seal	239797	[illegible]
ITB 10/Pk	22-36-00495	ITB PTFE Piston Seal 10/Pk	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

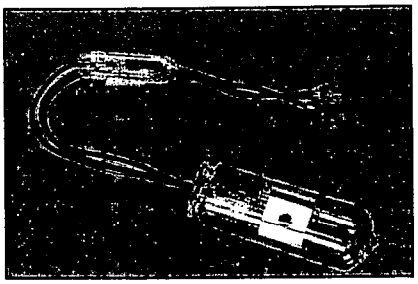
Beckman 114/114M, 116, 126

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ITB	22-36-00496	ITB PTFE Piston Seal	241037	[illegible]
ITB 10/Pk	22-36-00497	ITB PTFE Piston Seal 10/Pk	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Finding Parts for Beckman System Gold

[illegible]

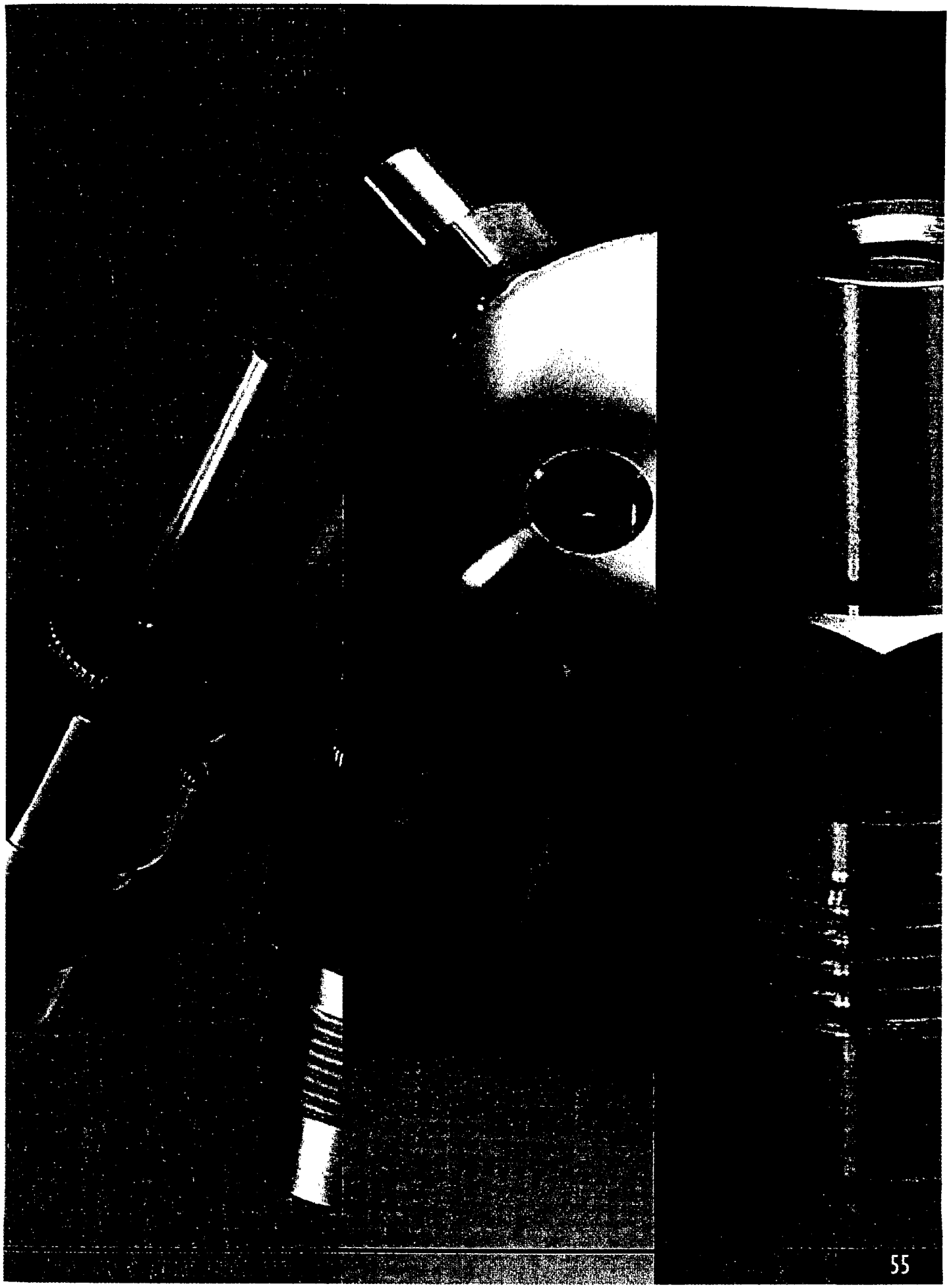
HPLC First Aid Kits™ are equipped with a complete set of precision components for your Beckman/Altex pump, giving you rapid access to the parts you need to keep your system running. Fittings Kits contain a useful selection of fittings, unions and plugs (see pages 46-47). Replacement lamps for your UV detector are guaranteed to meet or exceed OEM specifications.



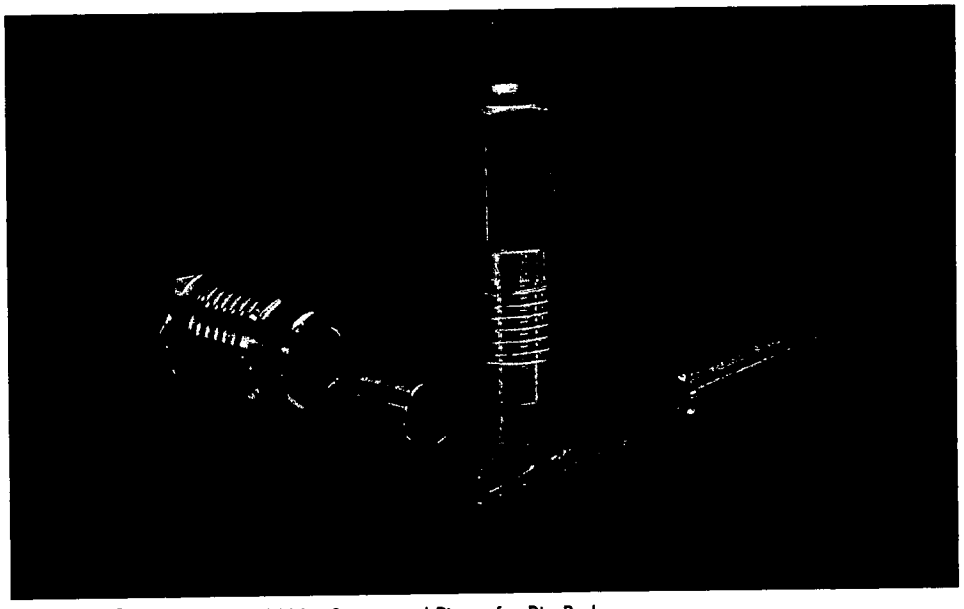
Lamp for Beckman/Altex M-163 and M-166 Detectors

Accessory Kits and Lamps

Type	OPTI-Part #	Description	OEM #	Price
1st AID KIT	22-08-01332	HPLC First Aid Kit, Beckman 100A	[illegible]	[illegible]
1st AID KIT	22-08-00471	HPLC First Aid Kit, Beckman 110A/110B	[illegible]	[illegible]
1st AID KIT	22-08-00472	HPLC First Aid Kit, Beckman 112/112M	[illegible]	[illegible]
1st AID KIT	22-08-00473	HPLC First Aid Kit, Beckman 114/114M, 116, 126	[illegible]	[illegible]
FIT KIT	22-08-00469	Fittings Kit (Beckman Injection Valve)		
FIT KIT	22-08-00432	Fittings Kit (Rheodyne Injection Valve)		
LAMP	22-32-01295	Lamp, M-163 and M-166 Detectors	239372	[illegible]



BIO-RAD



OPTI-MAX® Cartridge Check Valve System and Piston for Bio-Rad

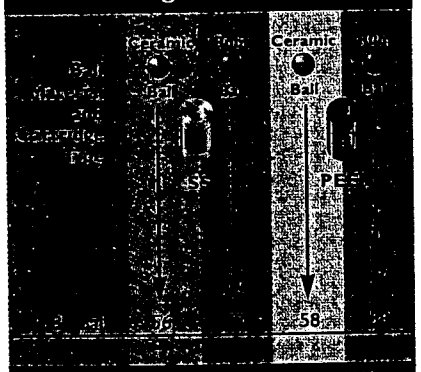
For maximum performance and proven reliability, choose OPTI-MAX Cartridge Check Valves for your Bio-Rad HPLC system. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom-designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one. Innovative Free-Turn™ housings let you switch cartridges without removing your connecting tubing.

OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See page 41 for more information.

Recommended Cartridge

OPTI-MAX Cartridge Code Chart



We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the right. See page 41 for more information.

OPTI-MAX® Cartridge Check Valves

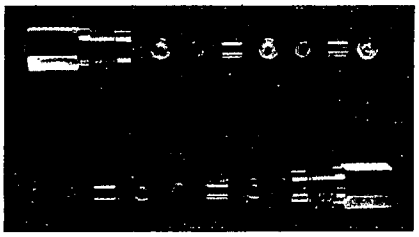
Bio-Rad 1330, 1350 FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
INLET	23[illegible]00546	OPTI-MAX Inlet Housing & Cartridge	125-0306	
OUTLET	23[illegible]00551	OPTI-MAX Outlet Housing & Cartridge	125-0307	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk		

number from this chart to select the cartridge type you need.

For those who prefer purchasing standard check valve assemblies or repairing check valves with rebuild kits, we offer these precision-machined replacement parts, guaranteed to meet or exceed OEM specifications.

Standard Check Valves

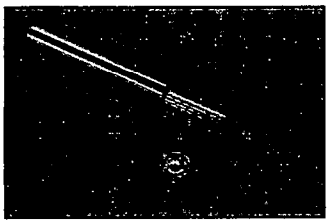


Bio-Rad 1330, 1350

Type	OPTI-Part #	Description	OEM #	Price
INLET	23-38-00538	Tested Inlet	125-0306	
OUTLET	23-38-00543	Tested Outlet	125-0307	
REBUILD	23-38-00545	Rebuild Kit (Rebuilds 2)		

Replacement seals and pistons from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.

Seals and Pistons



Bio-Rad 1330, 1350, 1350T, 2700

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
ITB	23-36-00531	ITB PTFE Piston Seal	125-0302	
ITB 10/PK	23-36-00532	ITB PTFE Piston Seal 10/Pk		
[illegible]	[illegible]	[illegible]	[illegible]	
PISTON	23-34-00530	Piston (1330, 1350, 1350T Only)	125-0304	

Don't let unexpected pump malfunctions catch you by surprise! Optimize offers HPLC First Aid Kits™ equipped with a complete set of precision components for your Bio-Rad pump, giving you rapid access to the parts you need to keep your system running. We also offer Fittings Kits which contain a useful selection of fittings, unions and plugs, value-priced and specifically tailored to your HPLC pump. See pages 46-47 for more information about accessory kits from Optimize.

Accessory Kits

Bio-Rad 1330, 1350

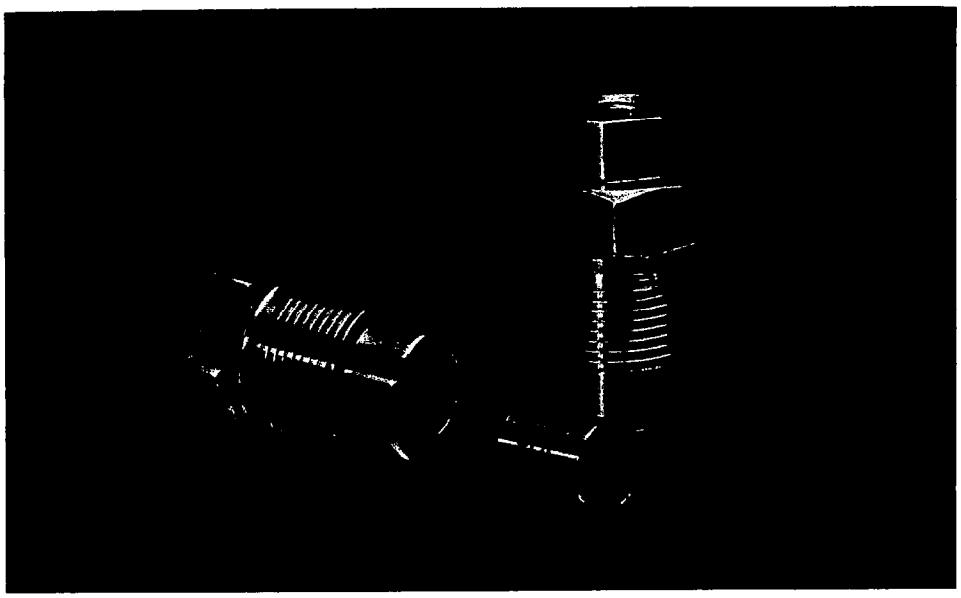
Type	OPTI-Part #	Description	Price
1st AID KIT	23-08-00526	HPLC First Aid Kit	
FIT KIT	23-08-00432	Fittings Kit	

BISCHOFF

For maximum performance and proven reliability, choose OPTI-MAX® Cartridge Check Valves for your Bischoff HPLC system. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom-designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one. Innovative Free-Turn™ housings let you switch cartridges without removing your connecting tubing.

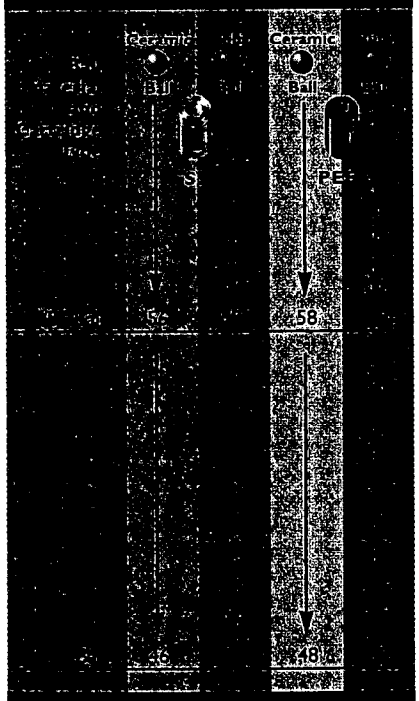
OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See pg. 41 for more information.



OPTI-MAX® Cartridge Check Valve System for Bischoff

Recommended Cartridge

OPTI-MAX Cartridge Code Chart



We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the right. See page 41 for more information.

OPTI-MAX® Cartridge Check Valves

Bischoff 2200, Anspec SM909, Alcott Micromeritics 760 FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
INLET	24[illegible]00576	OPTI-MAX Inlet Housing & Cartridge	2200-0220	
OUTLET	24[illegible]00581	OPTI-MAX Outlet Housing & Cartridge	2200-0230	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/8", Ball, 2/Pk		

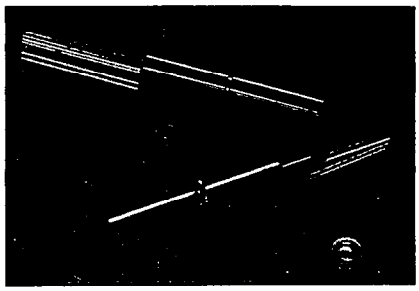
[illegible] number from this chart to select the cartridge type you need.

All Above Pump Models, Microbore Type FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
INLET	24[illegible]00585	OPTI-MAX Inlet Housing & Cartridge	2200-0120	
OUTLET	24[illegible]00589	OPTI-MAX Outlet Housing & Cartridge	2200-0130	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/16" Ball, 2/Pk		

[illegible] number from this chart to select the cartridge type you need.

Replacement seals and pistons from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.



Seals and Pistons

Bischoff 2200, Anspec SM909, Alcott Micromeritics 760

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
TTB	24-36-01303	TTB PTFE Piston Seal	2200-0212	[illegible]
TTB 10/Pk	24-36-01304	TTB PTFE Piston Seal 10/Pk	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
PISTON	24-34-00559	Piston	2200-0210	[illegible]

All Above Pump Models, Microbore Type

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
TTB	24-36-00574	TTB PTFE Piston Seal	2200-0112	[illegible]
TTB 10/Pk	24-36-00575	TTB PTFE Piston Seal 10/Pk	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
PISTON	24-34-00562	Piston	2200-0110	[illegible]

Don't let unexpected pump malfunctions catch you by surprise! Optimize offers HPLC First Aid Kits™ equipped with a complete set of precision components for your Bischoff pump, giving you rapid access to the parts you need to keep your system running. We also offer Fittings Kits which contain a useful selection of fittings, unions and plugs, value-priced and specifically tailored to your HPLC pump. See pages 46-47 for more information about accessory kits from Optimize.

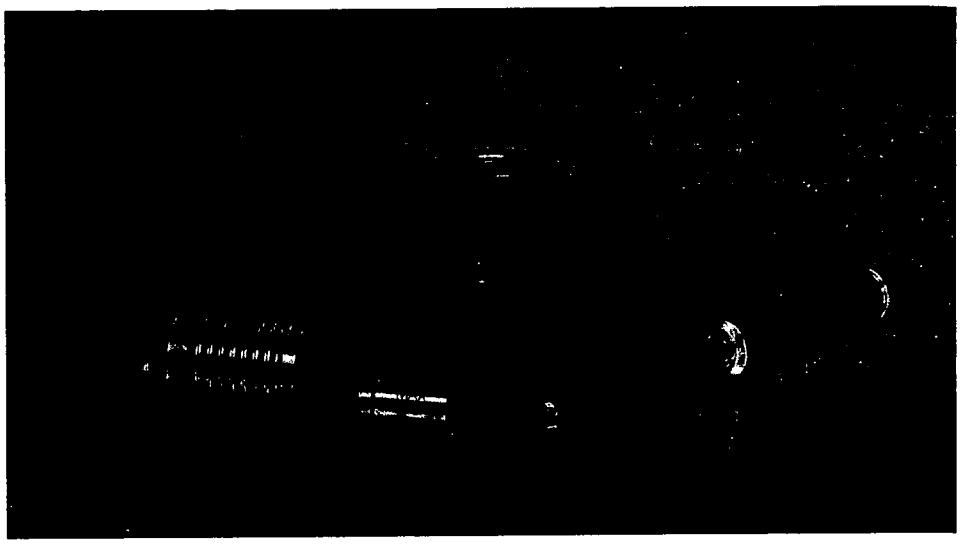
Accessory Kits

Analytical Bischoff 2200, Anspec SM909, Alcott Micromeritics 760

Type	OPTI-Part #	Description	Price
1st AID KIT	24-08-00557	HPLC First Aid Kit	[illegible]
FIT KIT	24-08-00432	Fittings Kit	[illegible]

All Above Pump Models, Microbore Type

Type	OPTI-Part #	Description	Price
1st AID KIT	24-08-00558	HPLC First Aid Kit	[illegible]



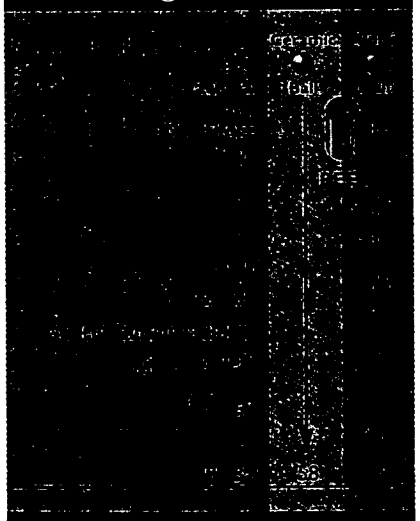
OPTI-MAX® Cartridge Check Valve System and Piston for Dionex

For maximum performance and proven reliability, choose OPTI-MAX Cartridge Check Valves for your Dionex HPLC system. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom-designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one. OPTI-MAX cartridges are available in PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See page 41 for more information.

Recommended Cartridge

OPTI-MAX Cartridge Code Chart



We recommend the PEEK/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the right. See page 41 for more information.

OPTI-MAX® Cartridge Check Valves

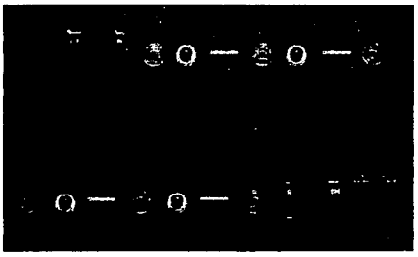
DQP, GPM-1, DRP, GPM-2, DXP, AGP (Analytical), 2000, 4000

Type	OPTI-Part #	Description	OEM #	Price
INLET	25[illegible]00613	OPTI-MAX Inlet Housing & Cartridge All Above Pump Models	38273	
OUTLET (Old Style)	25[illegible]00616	OPTI-MAX Outlet Housing & Cartridge DQP, GPM-1, DRP	38272	
OUTLET (New Style)	25[illegible]00612	OPTI-MAX Outlet Housing & Cartridge GPM-2, DXP, AGP (Analytical), 2000, 4000	42761	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk		

number from this chart to select the cartridge type you need.

For those who prefer purchasing standard check valve assemblies or repairing check valves with rebuild kits, we offer these precision-machined replacement parts, guaranteed to meet or exceed OEM specifications.

Standard Check Valves

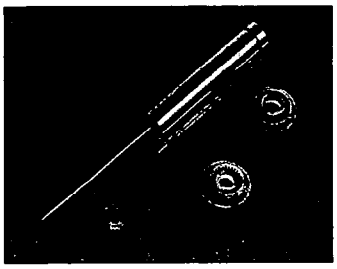


DQP, GPM-1, DRP, GPM-2, DXP, AGP (Analytical), 2000, 4000

Type	OPTI-Part #	Description	OEM #	Price
INLET	25-38-00605	Tested Inlet DQP, GPM-1, DRP, GPM-2, DXP, AGP (Analytical), 2000, 4000	38273	
OUTLET	25-38-00607	Tested Outlet (Old Style) DQP, GPM-1, DRP	38272	
OUTLET	25-38-00610	Tested Outlet (New Style) GPM-2, DXP, AGP (Analytical), 2000, 4000	4276	
REBUILD	25-38-00609	Rebuild Kit (Rebuilds 2), DQP, GPM-1, DRP, GPM-2, DXP, AGP (Analytical), 2000, 4000		

Replacement seals and pistons from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.

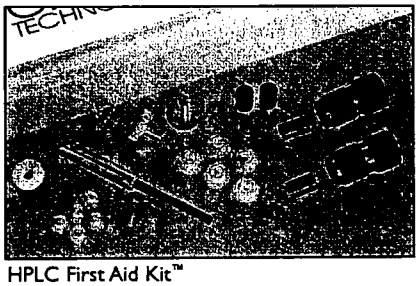
Pistons and Seals



GP40/IP20 (Analytical); DQP, GPM-1, DRP, GPM-2, DXP, AGP (Analytical), 2000, 4000

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]		
SEAL	25-36-00599	UHMWPE Piston Seal (Elastomer O-Ring)	35880	
SEAL 10/Pk	25-36-00600	UHMWPE Piston Seal (Elastomer O-Ring) 10/Pk		
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]		
PISTON	25-34-00596	Improved Ruby Piston For All Above Pumps Except GP40/IP20 Analytical	36904	

Don't let unexpected pump malfunctions catch you by surprise! Optimize offers HPLC First Aid Kits™ equipped with a complete set of precision components for your Dionex pump, giving you rapid access to the parts you need to keep your system running. We also offer Fittings Kits which contain a useful selection of fittings, unions and plugs, value-priced and specifically tailored to your HPLC pump. See pages 46-47 for more information about accessory kits from Optimize.

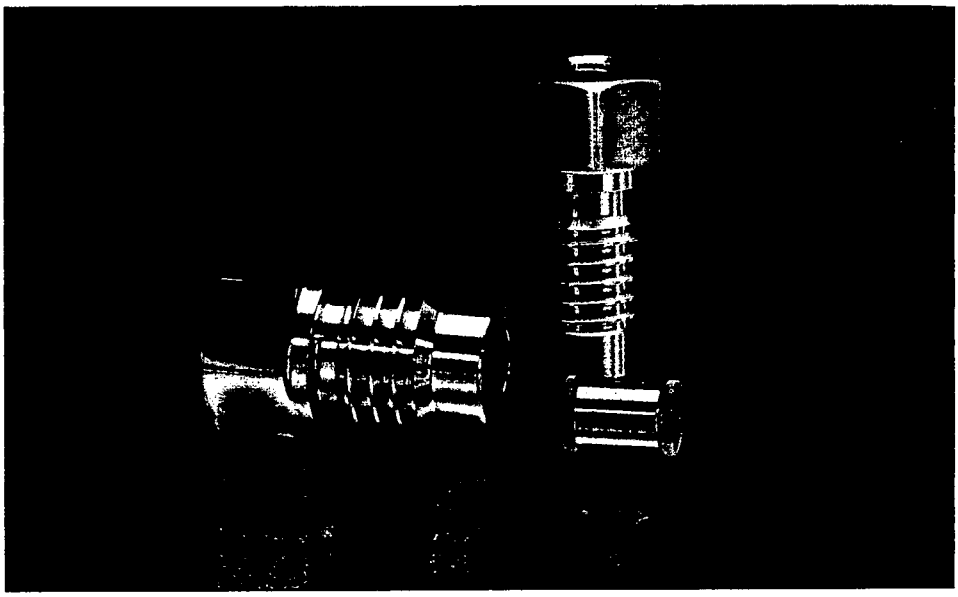


HPLC First Aid Kit™

Accessory Kits

Type	OPTI-Part #	Description	Price
1st AID KIT	25-08-00594	HPLC First Aid Kit, DQP, GPM-1, DRP	
1st AID KIT	25-08-00595	HPLC First Aid Kit, GPM-2, DXP, AGP (Analytical), 2000, 4000	
FIT KIT	25-08-00593	Fittings Kit, DQP, GPM-1, DRP, GPM-2, DXP, AGP (Analytical), 2000, 4000	

GILSON/RAININ



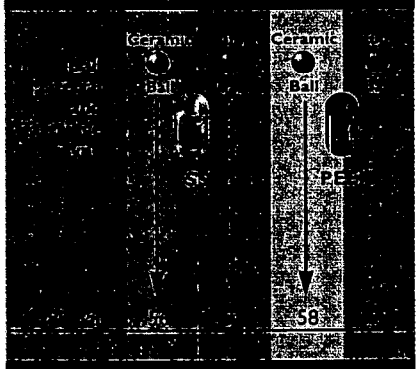
OPTI-MAX® Cartridge Check Valve System for Gilson/Rainin

For maximum performance and proven reliability, choose OPTI-MAX Cartridge Check Valves for your Gilson/Rainin HPLC system. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom-designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one. OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See page 41 for more information.

Recommended Cartridge

OPTI-MAX Cartridge Code Chart



We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that marches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the right. See page 41 for more information.

OPTI-MAX® Cartridge Check Valves

5, 10 & 25 mL S/SC Heads [Gilson, Rainin HP, HPX, HPXL, SD 200/300]

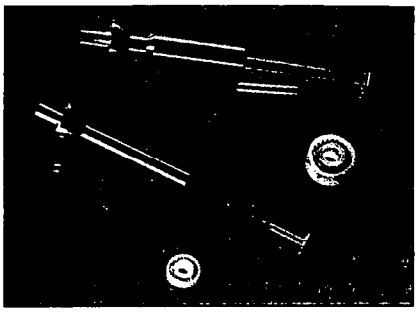
Type	OPTI-Part #	Description	OEM #	Price
INLET	26[illegible]00638	OPTI-MAX Inlet Housing & Cartridge	Gilson: 3645242 Rainin: E50131 & R007101616	
OUTLET	26[illegible]00647	OPTI-MAX Outlet Housing & Cartridge	Gilson: 3645245 Rainin: E50121 & R007101617	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges 1/8" Ball, 2/Pk		

number from this chart to select the cartridge type you need.

GILSON/RAININ

Gilson/Rainin pumps manufactured before 1985 (S Type) bear either an "S" or no marking on the pump head. Pumps manufactured subsequent to 1985 (SC Type) are identified with an "SC" on the pump head.

Replacement seals and pistons from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.



Seals and Pistons

10 mL S/SC Heads [Gilson, Rainin HP, HPX, HPXL, SD 200/300]

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]		
ITB™	26-36-00630	ITB PTFE Piston Seal	Gilson 5463125095 Rainin R007101636	
ITB 10/Pk	26-36-00631	ITB PTFE Piston Seal 10/Pk		
[illegible]	[illegible]	[illegible]	[illegible]	

5 mL S/SC Heads [Gilson, Rainin HP, HPX, HPXL, SD 200/300]

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]		
ITB™	26-36-00636	ITB PTFE Piston Seal	Gilson 5463088063 Rainin R007101633	
ITB 10/Pk	26-36-00637	ITB PTFE Piston Seal 10/Pk		
[illegible]	[illegible]	[illegible]	[illegible]	

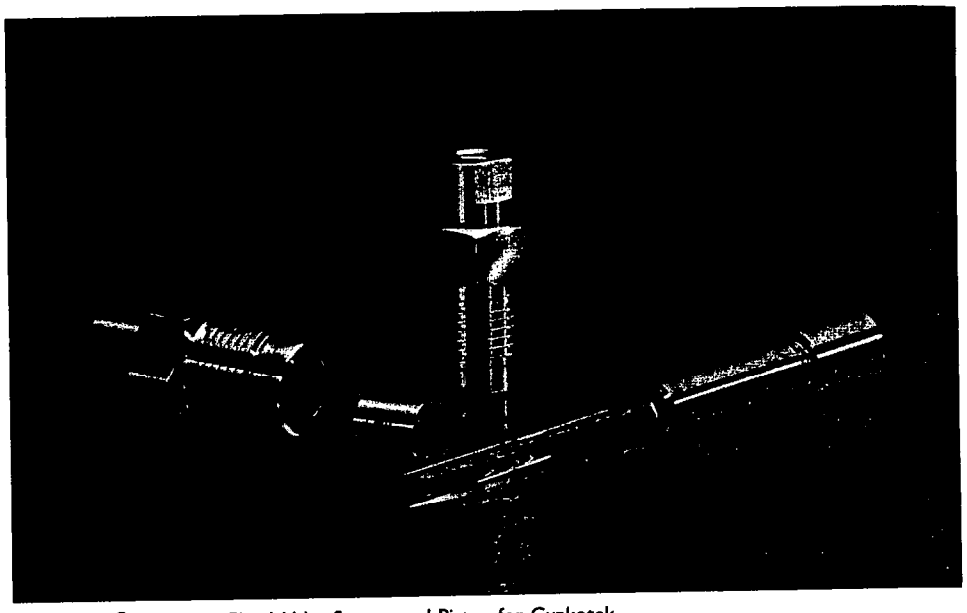
Don't let unexpected pump malfunctions catch you by surprise! Optimize offers HPLC First Aid Kits™ equipped with a complete set of precision components for your Gilson/Rainin pump, giving you rapid access to the parts you need to keep your system running. We also offer Fittings Kits which contain a useful selection of fittings, unions and plugs, value-priced and specifically tailored to your HPLC pump. See pages 46-47 for more information about accessory kits from Optimize.

Accessory Kits

10 mL & 5 mL SC Heads [Gilson, Rainin HP, HPX, HPXL, SD 200/300]

Type	OPTI-Part #	Description	Price
1st AID KIT	26-08-00622	HPLC First Aid Kit, 10 mL SC Type Head	
1st AID KIT	26-08-00623	HPLC First Aid Kit, 5 mL SC Type Head	
FIT KIT	26-08-00621	Fittings Kit, For Pumps with 5/10 mL SC Heads (Rheodyne Injection Valve)	

GYNKOTEK

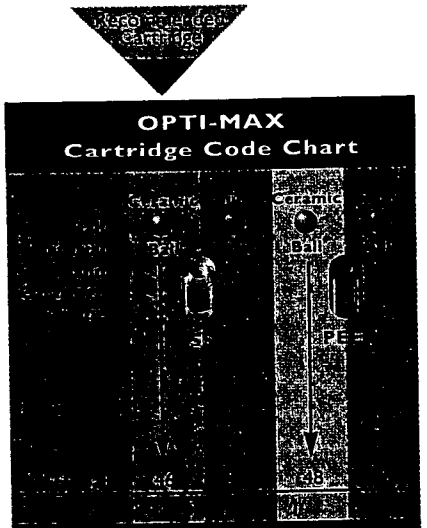


OPTI-MAX® Cartridge Check Valve System and Piston for Gynkotek

For maximum performance and proven reliability, choose OPTI-MAX Cartridge Check Valves for your Gynkotek HPLC system. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom-designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one. Innovative Free-Turn™ housings let you switch cartridges without removing your connecting tubing.

OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See page 41 for more information.



We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the right. See page 41 for more information.

OPTI-MAX® Cartridge Check Valves

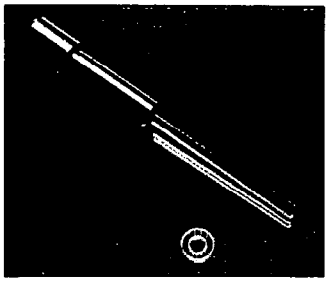
Gynkotek 300, M480, Analytical and Microbore FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
INLET	44[illegible]00451	OPTI-MAX Inlet Housing & Cartridge	5005-3200	
OUTLET	44[illegible]00460	OPTI-MAX Outlet Housing & Cartridge	5005-3100	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/16" Ball, 2/Pk		

number from this chart to select the cartridge type you need.

Replacement seals and pistons from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.

Seals and Pistons



Gynkotek 300, M480, Analytical Only

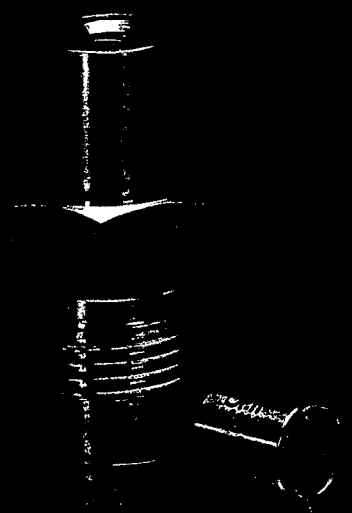
Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
PISTON	44-34-00434	Sapphire Piston	2267-0032	

Don't let unexpected pump malfunctions catch you by surprise! Optimize offers HPLC First Aid Kits™ equipped with a complete set of precision components for your Gynkotek pump, giving you rapid access to the parts you need to keep your system running. We also offer Fittings Kits which contain a useful selection of fittings, unions and plugs, value-priced and specifically tailored to your HPLC pump. See pages 46-47 for more information about accessory kits from Optimize.

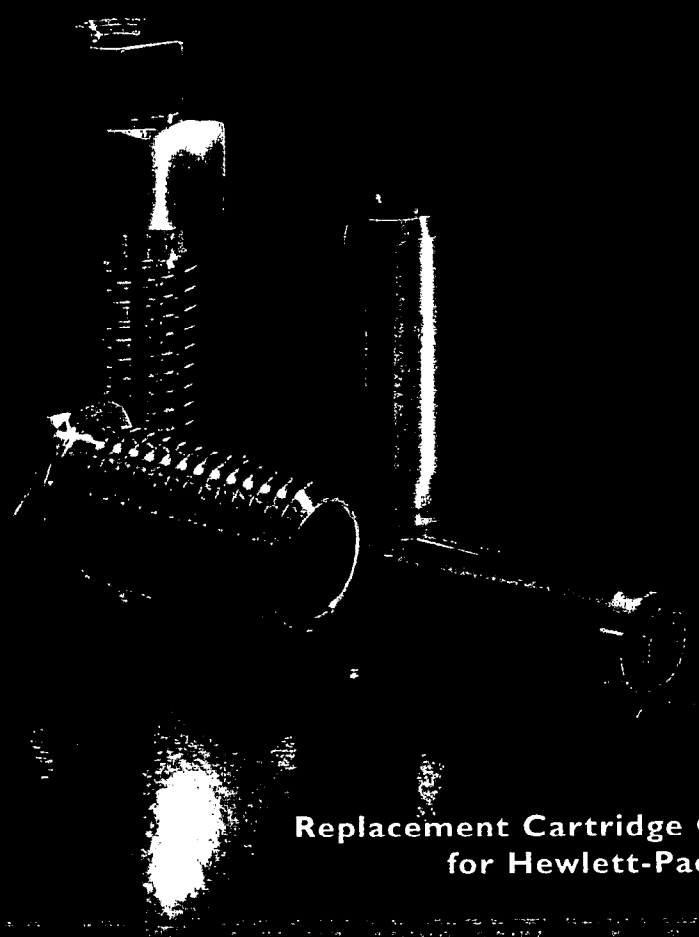
Accessory Kits

Gynkotek 300, M480, Analytical Only

Type	OPTI-Part #	Description	Price
1st AID KIT	44-08-00433	HPLC First Aid Kit	
FIT KIT	44-08-00432	Fittings Kit, All Gynkotek	



OPTI-MAX® Cartridge Check Valve System for Hewlett-Packard 1050



Replacement Cartridge Check Valve System for Hewlett-Packard 1090

HEWLETT-PACKARD

For maximum performance and proven reliability, choose OPTI-MAX® Cartridge Check Valves for your Hewlett-Packard HPLC system. Universal OPTI-MAX cartridges fit multiple pump models (and brands) using custom-designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one. Innovative Free-Turn™ housings let you switch cartridges without removing your connecting tubing.

OPTI-MAX cartridges come in either stainless steel (SS) or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See page 41 for more information.

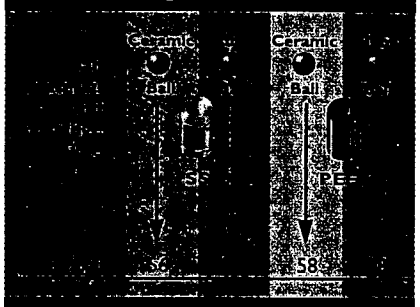
OPTI-MAX® Cartridge Check Valve

HP 1050, 1100 FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
OUTLET	27-[illegible]01330	OPTI-MAX Outlet Housing & Cartridge	01018-60008	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk		

Recommended Cartridge

OPTI-MAX Cartridge Code Chart



We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the left. See page 41 for more information.

For the HP-1090, we offer a cartridge-based check valve system designed as a direct replacement for OEM cartridge check valves, and guaranteed to meet or exceed OEM specifications.

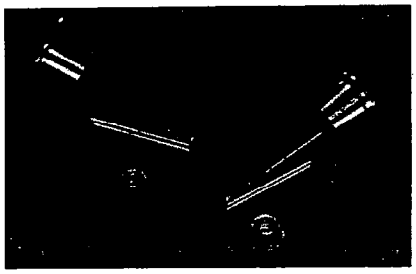
Standard Cartridge Check Valves

HP 1090

Type	OPTI-Part #	Description	OEM #	Price
INLET	27-38-00680	Tested Inlet Housing & Cartridge	79835-2521 / 79835-6710	
OUTLET	27-38-00682	Tested Outlet Housing & Cartridge	79835-2521 / 79835-6710	
CARTRIDGE	27-38-00672	Replacement Cartridges, 2/Pk	79835-6710	

HEWLETT-PACKARD

Replacement seals and plungers from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.



Seals and Plungers for HP 1050/1100, and HP 1090

Seals and Plungers

HP 1050, 1100

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
FTB	27-36-01572	FTB PTFE Plunger Seal	5062-8518	[illegible]
FTB 10/Pk	27-36-01573	FTB PTFE Plunger Seal 10/Pk	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

HP 1090

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
FTB	27-36-00665	FTB PTFE Plunger Seal	5062-2494	[illegible]
FTB 10/Pk	27-36-00666	FTB PTFE Plunger Seal 10/Pk	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Don't let unexpected pump malfunctions catch you by surprise! Optimize offers HPLC First Aid Kits™ equipped with a complete set of precision components for your Hewlett-Packard pump, giving you rapid access to the parts you need to keep your system running. We also offer Fittings Kits which contain a useful selection of fittings, unions and plugs, value-priced and specifically tailored to your HPLC pump. See pages 46-47 for more information about accessory kits from Optimize.

Accessory Kits

Type	OPTI-Part #	Description	Price
1st AID KIT	27-08-01331	HPLC First Aid Kit, HP 1050, 1100	[illegible]
1st AID KIT	27-08-00657	HPLC First Aid Kit, HP 1090	[illegible]
FIT KIT	27-08-00656	Fittings Kit, HP 1050, 1090, 1100	[illegible]

OPTI-MAX® Cartridge Check Valve System and Piston for Hitachi 655, L-6000, L-6200, L-6200A

For maximum performance and proven reliability, choose OPTI-MAX® Cartridge Check Valves for your Hitachi HPLC system. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom-designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one. Innovative Free-Turn™ housings let you switch cartridges without removing your connecting tubing.

OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See pg. 41 for more information.

OPTI-MAX® Cartridge Check Valve

Hitachi 655, L-6000, L-6200, L-6200A FREE-TURN™

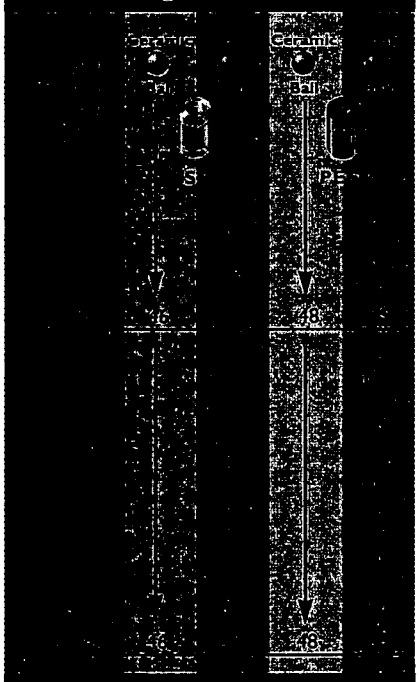
Type	OPTI-Part #	Description	OEM #	Price
INLET	28 00703	OPTI-MAX Inlet Housing & Cartridge	885-1330	
OUTLET	28 00712	OPTI-MAX Outlet Housing & Cartridge	885-1331	
CARTRIDGE	10 02004	OPTI-MAX Replacement Cartridges 1/16" Ball 2/Pk		

Hitachi L-7100 (LaChrom®)

Type	OPTI-Part #	Description	OEM #	Price
INLET	28 02092	OPTI-MAX Inlet Housing & Cartridge	810-1004	
OUTLET	28 02094	OPTI-MAX Outlet Housing & Cartridge	810-1005	
CARTRIDGE	10 02004	OPTI-MAX Replacement Cartridges 1/16" Ball 2/Pk		

Recommended Cartridge

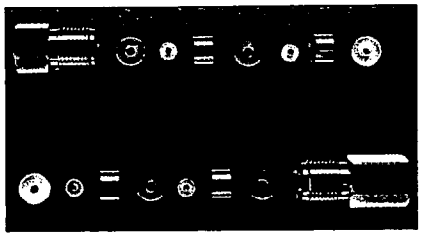
OPTI-MAX Cartridge Code Chart



We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the left. See page 41 for more information.

HITACHI

For those who prefer purchasing standard check valve assemblies or repairing check valves with rebuild kits, we offer these precision-machined replacement parts, guaranteed to meet or exceed OEM specifications.

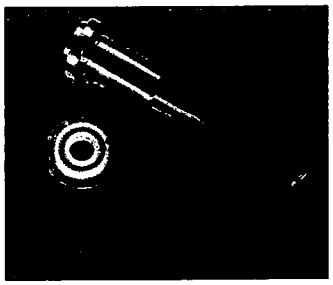


Standard Check Valves

Hitachi 655, L-6000, L-6200, L-6200A

Type	OPTI-Part #	Description	OEM #	Price
INLET	28-38-00694	Tested Inlet	885-1330	
OUTLET	28-38-00699	Tested Outlet	885-1331	
REBUILD	28-38-00701	Rebuild Kit (Rebuilds 2)		

Replacement seals and pistons from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.



Seals and Pistons

Hitachi 655, L-6000, L-6200, L-6200A, L-7100 (LaChrom®)

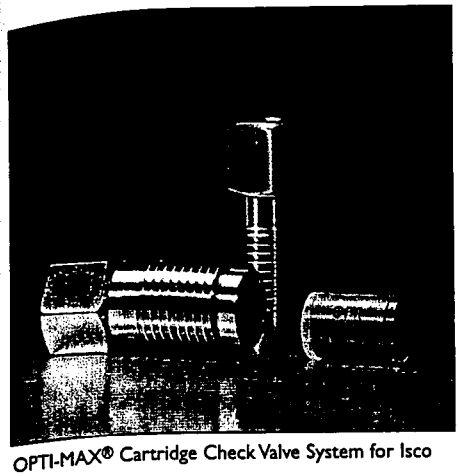
Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
ITB	28-36-00688	ITB PTFE Piston Seal	655-1080	
ITB 10/Pk	28-36-00689	ITB PTFE Piston Seal 10/Pk		
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
PISTON	28-34-00685	Sapphire Piston	1816-1033	

Don't let unexpected pump malfunctions catch you by surprise! Optimize offers HPLC First Aid Kits™ equipped with a complete set of precision components for your Hitachi pump, giving you rapid access to the parts you need to keep your system running. We also offer Fittings Kits which contain a useful selection of fittings, unions and plugs, value-priced and specifically tailored to your HPLC pump. See pages 46-47 for more information about accessory kits from Optimize.

Accessory Kits

Hitachi 655, L-6000, L-6200, L-6200A

Type	OPTI-Part #	Description	Price
1st AID KIT	28-08-00684	HPLC First Aid Kit	
FIT KIT	28-08-00683	Fittings Kit	



OPTI-MAX® Cartridge Check Valve System for Isco

For maximum performance and proven reliability, choose OPTI-MAX® Cartridge Check Valves for your Isco HPLC system. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom-designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one.

OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See page 41 for more information.

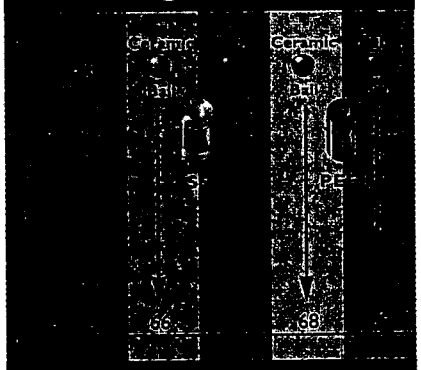
OPTI-MAX® Cartridge Check Valve

Isco 2300, 2350

Type	OPTI-Part #	Description	OEM #	Price
INLET	29-[illegible]01343	OPTI-MAX Inlet Housing & Cartridge	60-2253-240	
OUTLET	29-[illegible]01344	OPTI-MAX Outlet Housing & Cartridge	60-2253-209	
CARTRIDGE	10-[illegible]02005	OPTI-MAX Replacement Cartridges 3/16" Ball-2/Pk		

Recommended Cartridge

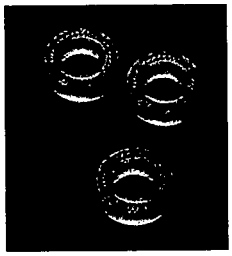
OPTI-MAX Cartridge Code Chart



We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the left. See page 41 for more information.

Replacement seals from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.

Piston Seals



Isco 2300, 2350

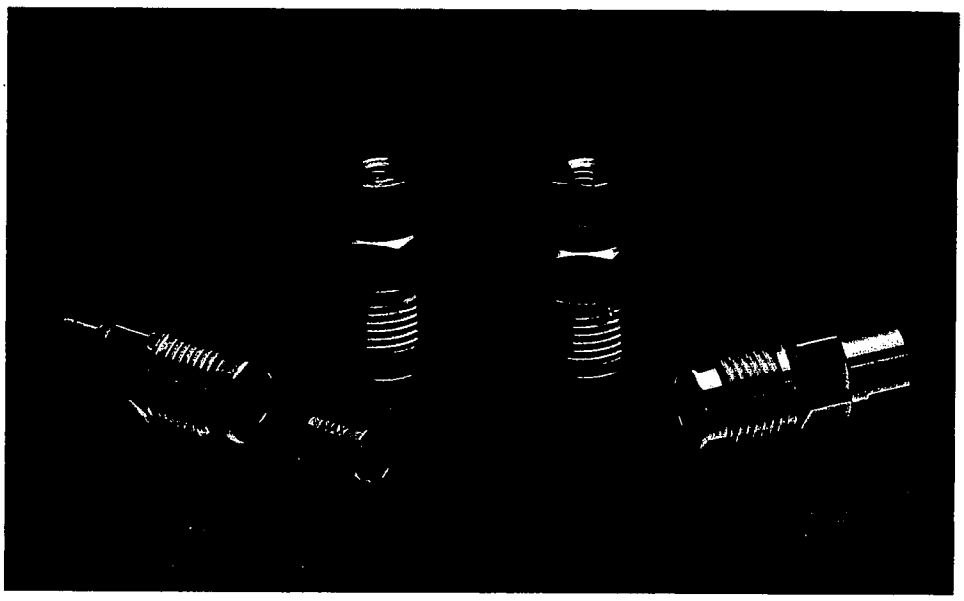
Type	OPTI-Part #	Description	OEM #	Price
OPTI-SEAL®	[illegible]	[illegible]	[illegible]	
OS, 10/pk	[illegible]	[illegible]		
ITB™	29-36-00723	ITB PTFE Piston Seal Primary	208-0230-01	
ITB, 10/Pk	29-36-00724	ITB PTFE Piston Seal Primary, 10/Pk		
OPTI-SEAL®	[illegible]	[illegible]	[illegible]	
OS, 10/Pk	[illegible]	[illegible]		
ITB™	29-36-01303	ITB PTFE Piston Seal Secondary	202-3090-12	
ITB, 10/Pk	29-36-01304	ITB PTFE Piston Seal Secondary, 10/Pk		

JASCO

For maximum performance and proven reliability, choose OPTI-MAX® Cartridge Check Valves for your Jasco HPLC system. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom-designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one. Innovative Free-Turn™ housings let you switch cartridges without removing your connecting tubing.

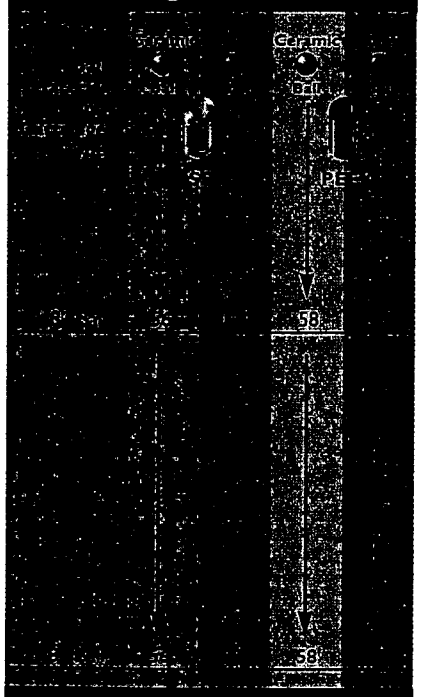
OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See pg. 41 for more information.



OPTI-MAX® Cartridge Check Valve System for Jasco BIP-1 (left) and Jasco 880/980 Series (right)

Recommended Cartridge

OPTI-MAX Cartridge Code Chart



We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the right. See page 41 for more information.

OPTI-MAX® Cartridge Check Valves

Jasco BIP-1 FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
INLET	42[illegible]01038	OPTI-MAX Inlet Housing & Cartridge	6260-H101A	
OUTLET	42[illegible]01043	OPTI-MAX Outlet Housing & Cartridge	6260-H102A	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/8", Ball, 2/Pk		

[illegible] number from this chart to select the cartridge type you need.

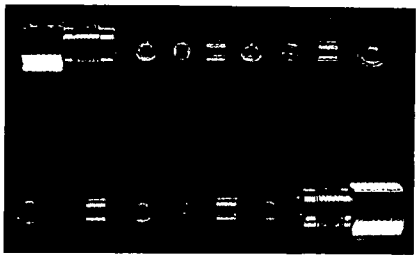
Jasco 880/980 Series FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
INLET	42[illegible]01544	OPTI-MAX Inlet Housing & Cartridge	6560-405A	
OUTLET	42[illegible]01546	OPTI-MAX Outlet Housing & Cartridges	6560-404A	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/8", Ball, 2/Pk		

[illegible] number from this chart to select the cartridge type you need.

For those who prefer purchasing standard check valve assemblies or repairing check valves with rebuild kits, we offer these precision-machined replacement parts, guaranteed to meet or exceed OEM specifications.

Standard Check Valves

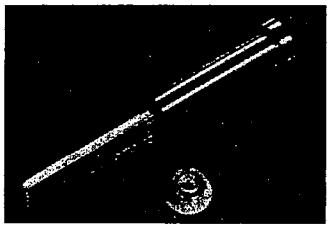


Jasco BIP-I

Type	OPTI-Part #	Description	OEM #	Price
INLET	42-38-01016	Tested Inlet	6260-H101A	
OUTLET	42-38-01021	Tested Outlet	6260-H102A	
REBUILD	42-38-01023	Rebuild Kit (Rebuilds 2, BIP-I or 880/980)		

Replacement seals and pistons from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.

Seals and Pistons



Jasco BIP-I, 880/980 Series

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
TFB	42-36-01335	TFB PTFE Piston Seal	6560-H138A & 6560-H139A	
TFB 10/Pk	42-36-01336	TFB PTFE Piston Seal 10/Pk	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
PISTON	42-34-01334	Sapphire Piston	2165-0005A & 6560-H107A	

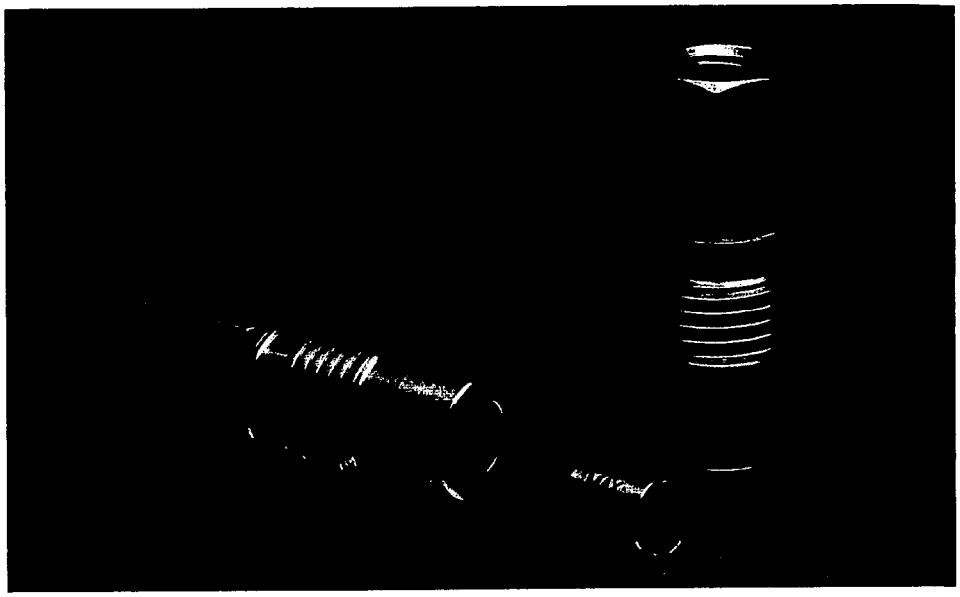
Don't let unexpected pump malfunctions catch you by surprise! Optimize offers HPLC First Aid Kits™ equipped with a complete set of precision components for your Jasco pump, giving you rapid access to the parts you need to keep your system running. We also offer Fittings Kits which contain a useful selection of fittings, unions and plugs, value-priced and specifically tailored to your HPLC pump. See pages 46-47 for more information about accessory kits from Optimize.

Accessory Kits

Jasco BIP-I, 880/980 Series

Type	OPTI-Part #	Description	Price
1st AID KIT	42-08-01348	HPLC First Aid Kit BIP-I	
1st AID KIT	42-08-02047	HPLC First Aid Kit 880/980 Series	
FIT KIT	42-08-00913	Fittings Kit (Valco Injection Valve)	
FIT KIT	42-08-00432	Fittings Kit (Rheodyne Injection Valve)	

LDC/MILTON ROY



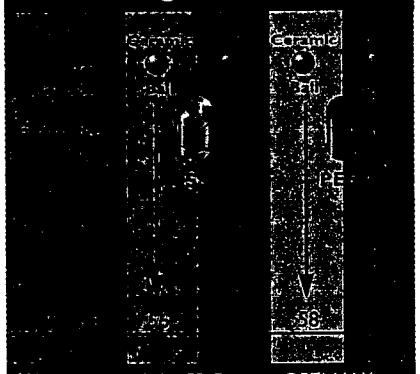
OPTI-MAX® Cartridge Check Valve System for LDC/Milton Roy

For maximum performance and proven reliability, choose OPTI-MAX Cartridge Check Valves for your LDC/Milton Roy, Minimetric, Minipump, Constametric, and IBM LC-9660 HPLC systems. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom-designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one. OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See page 41 for more information.

Recommended Cartridge

OPTI-MAX
Cartridge Code Chart



We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the right. See page 41 for more information.

OPTI-MAX® Cartridge Check Valves

LDC/Milton Roy, All Analytical

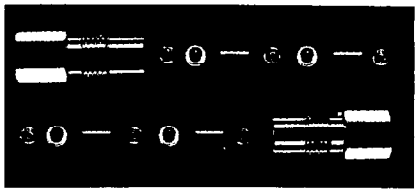
Type	OPTI-Part #	Description	OEM #	Price
INLET	31[illegible]00759	OPTI-MAX Inlet Housing & Cartridge	900947001	
OUTLET	31[illegible]00764	OPTI-MAX Outlet Housing & Cartridge	900947002	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk		

number from this chart to select the cartridge type you need.

LDC/MILTON ROY

For those who prefer purchasing standard check valve assemblies or repairing check valves with rebuild kits, we offer these precision-machined replacement parts, guaranteed to meet or exceed OEM specifications.

Standard Check Valves

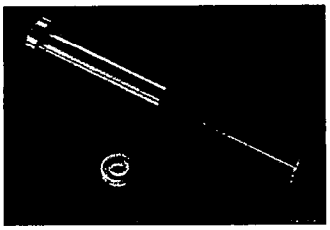


LDC/Milton Roy, All Analytical

Type	OPTI-Part #	Description	OEM #	Price
SUCTION	31-38-00755	Tested Suction Check Valve	900947001	
DISCHARGE	31-38-00756	Tested Discharge Check Valve	900947002	
REBUILD	31-38-00757	Rebuild Kit (Rebuilds 1)	900517	
	31-24-00735	1/8" Nut & Ferrule For Suction Tube	1960066976	
	31-24-00736	1/16" Nut & Ferrule For Discharge Tube	1960066975	

Replacement seals and plungers from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.

Seals and Plungers



Seal Replacement Kits

LDC/Milton Roy, All Analytical

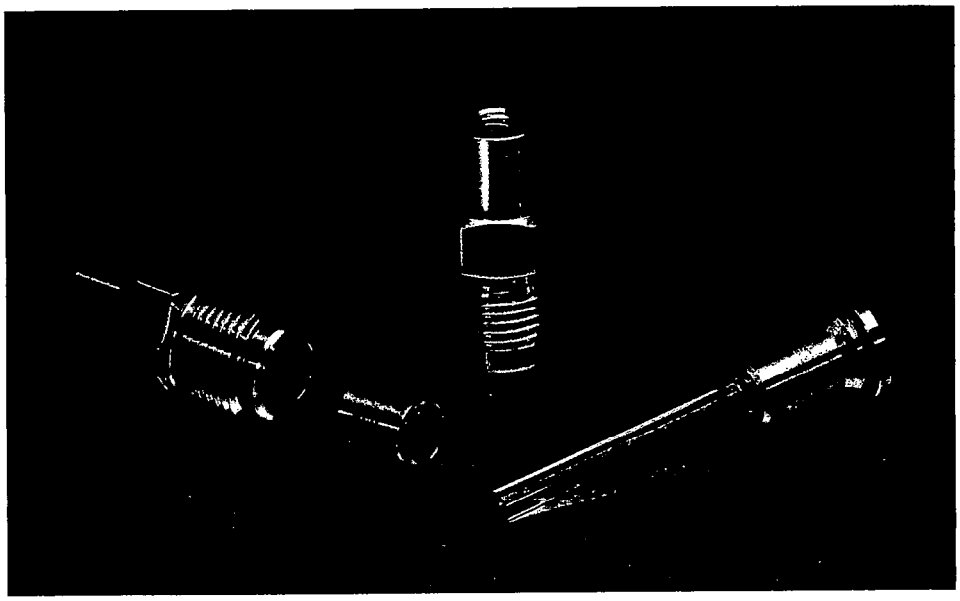
Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]		
	31-36-00754	Replacement Kit OPTI SEAL	801598	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]		
	31-36-00750	Replacement Kit TB Seal	801598	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]		
	31-36-00747	Replacement Kit Gold Seal	801892001	
[illegible]	[illegible]	[illegible]	[illegible]	
SPRING	31-34-00739	Crosshead Spring, Constametric II, Minipump	9160282000	
SPRING	31-34-00740	Crosshead Spring, Minimetric	204040	

Optimize offers HPLC First Aid Kits™ equipped with a complete set of precision components for your LDC/Milton Roy pump, giving you rapid access to the parts you need to keep your system running. Fittings Kits contain a useful selection of fittings, unions and plugs, value-priced and specifically tailored to your HPLC pump. See pages 46-47 for more information about these kits. Replacement lamps for your UV detector are guaranteed to meet or exceed OEM specifications.

Accessory Kits and Lamps

Type	OPTI-Part #	Description	OEM #	Price
1st AID KIT	31-08-00734	HPLC First Aid Kit, All Analytical Pumps		
FIT KIT	31-08-00733	Fittings Kit		
LAMP	31-32-01295	Deuterium Lamp, Spectromonitor III & D, 3100 & 4000 Series	108035	

LKB

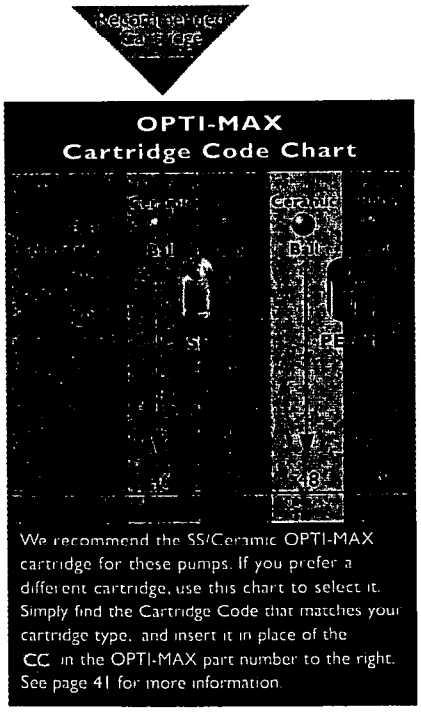


OPTI-MAX® Cartridge Check Valve System and Piston for LKB

For maximum performance and proven reliability, choose OPTI-MAX Cartridge Check Valves for your LKB HPLC system. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom-designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one. Innovative Free-Turn™ housings let you switch cartridges without removing your connecting tubing.

OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See page 41 for more information.



We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the right. See page 41 for more information.

OPTI-MAX® Cartridge Check Valves

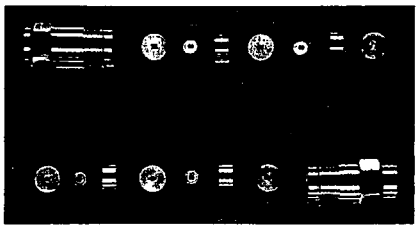
LKB 2150, 2248 FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
INLET	32[illegible]00782	OPTI-MAX Inlet Housing & Cartridge	80-1035-19	
OUTLET	32[illegible]00787	OPTI-MAX Outlet Housing & Cartridge	80-1035-20	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/16" Ball, 2/Pk		

number from this chart to select the cartridge type you need.

For those who prefer purchasing standard check valve assemblies or repairing check valves with rebuild kits, we offer these precision-machined replacement parts, guaranteed to meet or exceed OEM specifications.

Standard Check Valves

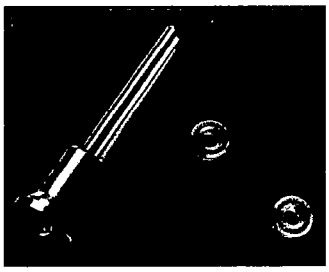


LKB 2150, 2248

Type	OPTI-Part #	Description	OEM #	Price
INLET	32-38-00774	Tested Inlet	80-1035-19	
OUTLET	32-38-00779	Tested Outlet	80-1035-20	
REBUILD	32-38-00781	Rebuild Kit (Rebuilds 2)		

Replacement seals and pistons from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.

Seals and Pistons



LKB 2150, 2248

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]		
ITB™	32-36-01303	ITB PTFE Piston Seal (7 Back Up Rings)	80-1037-39	
ITB 10/Pk	32-36-01304	ITB PTFE Piston Seal (10 Pk w/ Back Up Rings)		
[illegible]	[illegible]	[illegible]	[illegible]	

Don't let unexpected pump malfunctions catch you by surprise! Optimize offers HPLC First Aid Kits™ equipped with a complete set of precision components for your LKB pump, giving you rapid access to the parts you need to keep your system running. We also offer Fittings Kits which contain a useful selection of fittings, unions and plugs, value-priced and specifically tailored to your HPLC pump. See pages 46-47 for more information about accessory kits from Optimize.

Accessory Kits

LKB 2150

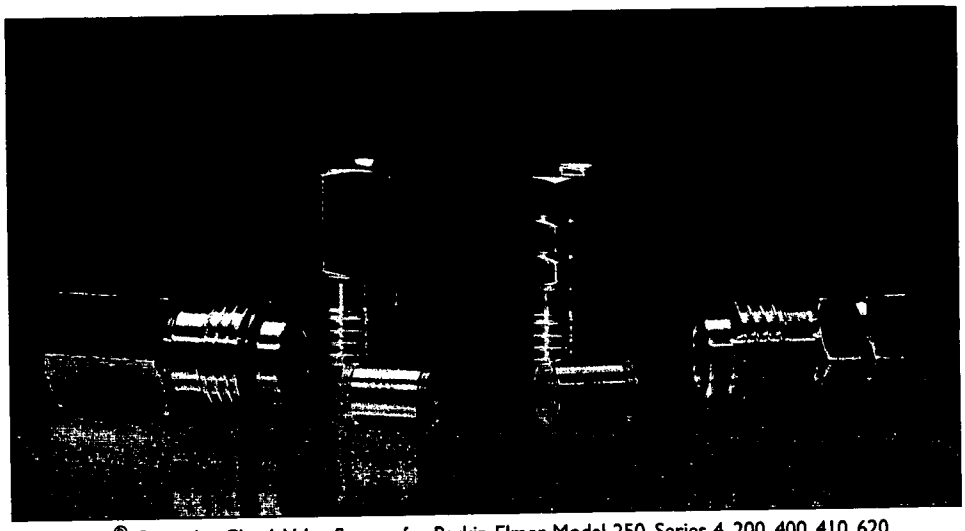
Type	OPTI-Part #	Description	Price
1st AID KIT	32-08-00770	HPLC First Aid Kit	
FIT KIT	32-08-00432	Fittings Kit	

PERKIN-ELMER

For maximum performance and proven reliability, choose OPTI-MAX® Cartridge Check Valves for your Perkin-Elmer HPLC system. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom-designed housings.

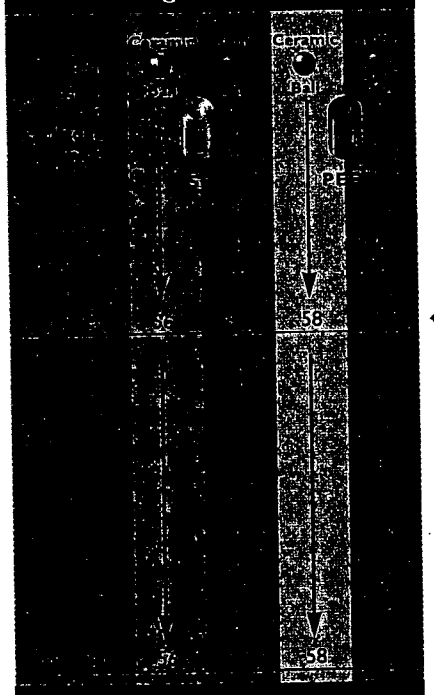
Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one.

OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See page 41 for more information.



OPTI-MAX® Cartridge Check Valve System for Perkin-Elmer Model 250, Series 4, 200, 400, 410, 620, Integral 4000 (left) and Perkin-Elmer Series 1, 2, 3, 3B, 10 (right)

OPTI-MAX Cartridge Code Chart



We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the right. See page 41 for more information.

OPTI-MAX® Cartridge Check Valves

Series 1, 2, 3, 3B, 10

Type	OPTI-Part #	Description	OEM #	Price
INLET	33[illegible]00840	OPTI-MAX Inlet Housing & Cartridge	0254-0546	
OUTLET	33[illegible]00845	OPTI-MAX Outlet Housing & Cartridge	0254-0547	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk		

[illegible] number from this chart to select the cartridge type you need.

Model 250, Series 4, 200*, 400, 410, 620, Integral 4000* FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
INLET	33[illegible]00830	OPTI-MAX Inlet Housing & Cartridge	0254-0177	
OUTLET	33[illegible]00835	OPTI-MAX Outlet Housing & Cartridge	0254-0197	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk		

[illegible] number from this chart to select the cartridge type you need.

For those who prefer repairing check valves with rebuild kits, we offer these precision-made kits.

Standard Check Valve Rebuild Kits (Rebuilds 2)

Type	OPTI-Part #	Description	Price
REBUILD	33-38-00828	Series 1, 2, 3, 3B, 10	
REBUILD	33-38-00821	Model 250, Series 4, 200, 400, 410, 620, Integral 4000	

Replacement seals and pistons from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.

Seals and Pistons

Model 250, Series 200, 410, 620, Integral 4000, [Mfd. After 12/89]

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
PISTON	33-34-00797	Piston, Low Pressure (LP)	N260-0104	[illegible]

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

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ITB	33-36-01799	ITB PTFE Piston Seal, HP	0990-7328	[illegible]
ITB 10/PK	33-36-01800	ITB PTFE Piston Seal, HP 10pk	[illegible]	[illegible]

Series 4, 400, 410, 620, Integral 4000

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ITB	33-36-00802	ITB PTFE Piston Seal, LP	0990-7330	[illegible]
ITB 10/PK	33-36-00803	ITB PTFE Piston Seal, LP 10/PK	[illegible]	[illegible]

Series 4, 400, 410, 620, [Mfd. Before 12/89]

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
PISTON	33-34-00800	Piston, LP	0254-2149	[illegible]

Series 10

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Series 1, 2, 3, 3B

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

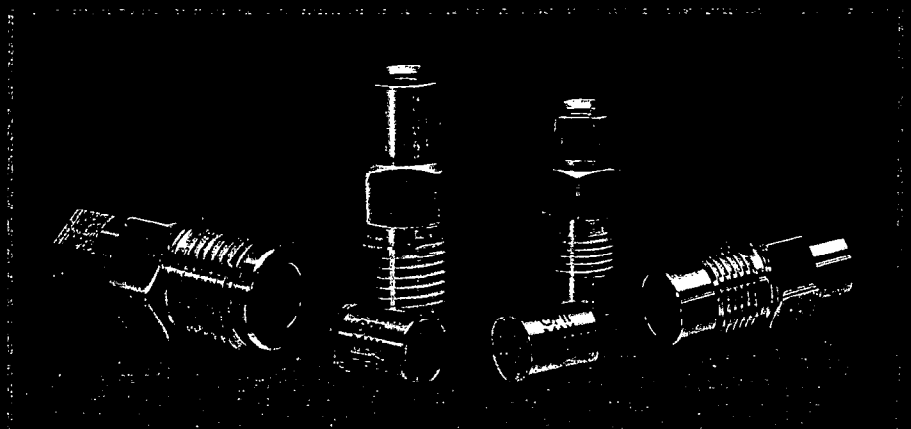
Series 100

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ITB	33-36-00808	ITB PTFE Piston Seal	N260-0109	[illegible]
ITB 10/PK	33-36-00809	ITB PTFE Piston Seal 10/PK	[illegible]	[illegible]

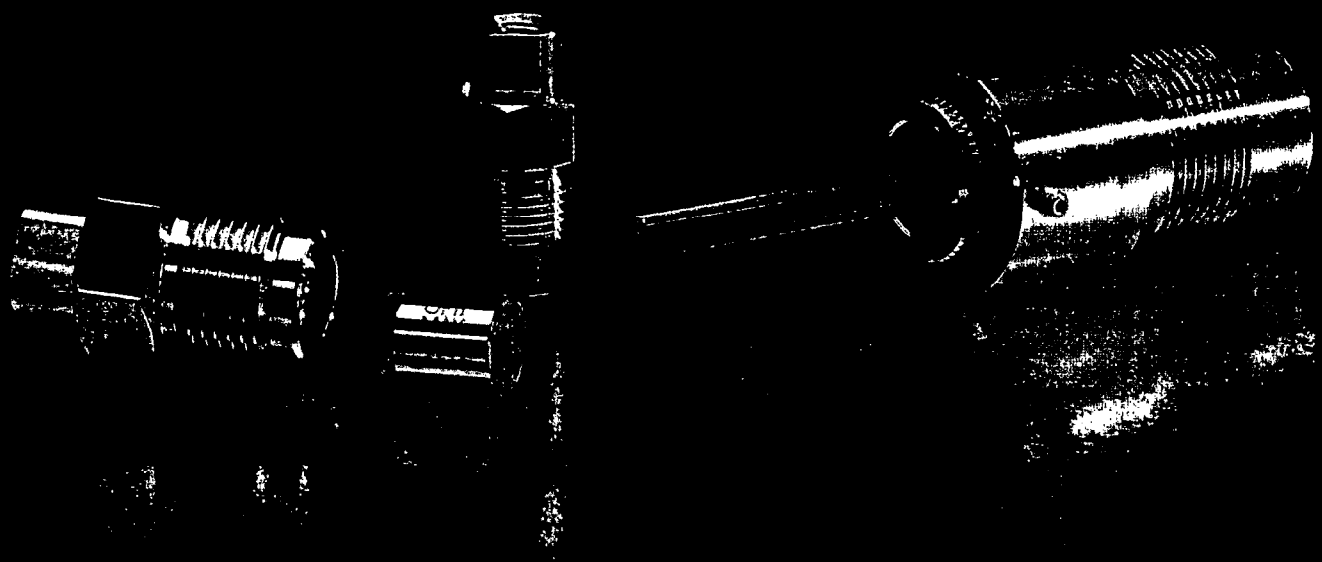
Don't let unexpected pump malfunctions catch you by surprise! Optimize offers HPLC First Aid Kits™ equipped with a complete set of precision components for your Perkin-Elmer pump, giving you rapid access to the parts you need to keep your system running. We also offer Fittings Kits which contain a useful selection of fittings, unions and plugs, value-priced and specifically tailored to your HPLC pump. See pages 46-47 for more information about accessory kits from Optimize.

Accessory Kits

Type	OPTI-Part #	Description	Price
1st AID KIT	33-08-00793	HPLC First Aid Kit, Model 250, Series 200, 410, 620, Integral 4000 [Mfd. After 12/89]	[illegible]
1st AID KIT	33-08-00794	HPLC First Aid Kit, Series 4, 400, 410, 620 [Mfd. Before 12/89]	[illegible]
1st AID KIT	33-08-00795	HPLC First Aid Kit, Series 10	[illegible]
1st AID KIT	33-08-00796	HPLC First Aid Kit, Series 1/2/3/3B	[illegible]
FIT KIT	33-08-00621	Fittings Kit, All Perkin Elmer Pumps	[illegible]



OPTI-MAX® Cartridge Check Valve System for Shimadzu LC-10AS and LC-10AD



OPTI-MAX® Cartridge Check Valve System and Universal Plunger for Shimadzu LC-10AT

For maximum performance and proven reliability, choose OPTI-MAX® Cartridge Check Valves for your Shimadzu or ESA Model 580 HPLC pump. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom-designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one. Innovative Free-Turn™ housings let you switch cartridges without removing your connecting tubing.

OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See page 41 for more information.

OPTI-MAX® Cartridge Check Valves

Shimadzu LC-6A, LC-10AS FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
INLET	34-00902	OPTI-MAX Inlet Housing & Cartridge	228-12353-91	
OUTLET	34-00907	OPTI-MAX Outlet Housing & Cartridge	228-09054-93	
CARTRIDGE	10-02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk		

Shimadzu LC-600/LC-9A, LC-10AD, ESA Model 580 FREE-TURN™

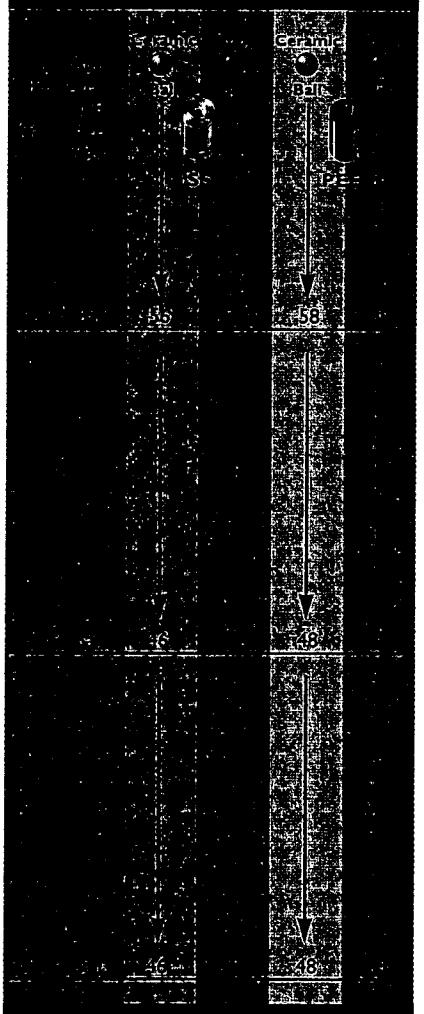
Type	OPTI-Part #	Description	OEM #	Price
INLET	34-00885	OPTI-MAX Inlet Housing & Cartridge	228-18522-91	
OUTLET	34-00893	OPTI-MAX Outlet Housing & Cartridge	228-18522-92	
CARTRIDGE	10-02004	OPTI-MAX Replacement Cartridges, 1/16" Ball, 2/Pk		

Shimadzu LC-10AT FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
INLET	34-01983	OPTI-MAX Inlet Housing & Cartridge	228-32166-91	
OUTLET	34-00893	OPTI-MAX Outlet Housing & Cartridge	228-32531-92	
CARTRIDGE	10-02004	OPTI-MAX Replacement Cartridges, 1/16" Ball, 2/Pk		

Recommended Cartridge

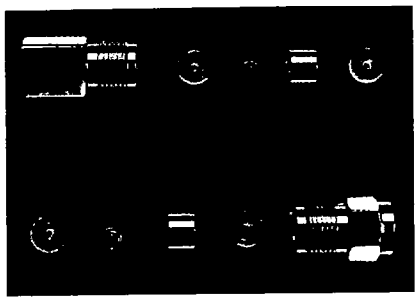
OPTI-MAX Cartridge Code Chart



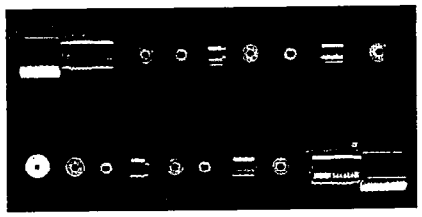
We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the left. See page 41 for more information.

SHIMADZU

For those who prefer purchasing standard check valve assemblies or repairing check valves with rebuild kits, we offer these precision-machined replacement parts, guaranteed to meet or exceed OEM specifications.



Standard Check Valves for LC-6A, LC-10AS



Standard Check Valves for LC-600/LC-9A, LC-10AD

Standard Check Valves

Shimadzu LC-6A, LC-10AS

Type	OPTI-Part #	Description	OEM #	Price
INLET	34-38-00877	Tested Inlet	228-12369-91	
OUTLET	34-38-00882	Tested Outlet	228-09054-91	
REBUILD	34-38-00884	Rebuild Kit (Rebuilds 2)	228-11200-91	

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

Type	OPTI-Part #	Description	OEM #	Price
INLET	34-38-00867	Tested Inlet	228-18522-91	
OUTLET	34-38-00871	Tested Outlet	228-18522-92	
REBUILD	34-38-00876	Rebuild Kit (Rebuilds 2)	228-24410-91	

Introducing...

Universal Plunger for Shimadzu LC-10AS & LC-10AT

The Universal Plunger System is now available for the Shimadzu LC-10AS and LC 10AT. Our exclusive plunger adapter allows you to use our LC-10AS plunger with both the LC-10AS and LC-10AT pumps.

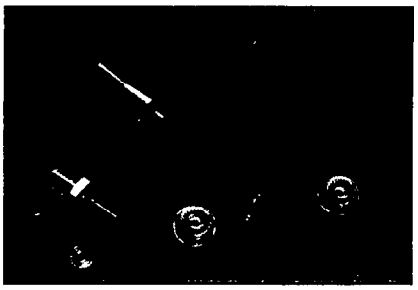
If you need a new plunger for your LC-10AT, you'll need our complete LC-10AT Plunger Assembly (34-34-01997). This assembly includes a 10AS plunger and the 10AT adapter. For subsequent plunger replacements, you only need to install a new LC-10AS plunger (34-34-01345) into the universal adapter. The 10AT plunger adapter is reusable — once you have it, you only need to stock a single plunger to cover both Shimadzu pumps. Lower your replacement costs, reduce waste and minimize plunger inventory with the Universal Plunger System from Optimize.

Replacement seals and plungers from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.

Seals and Plungers

Shimadzu LC-6A

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]



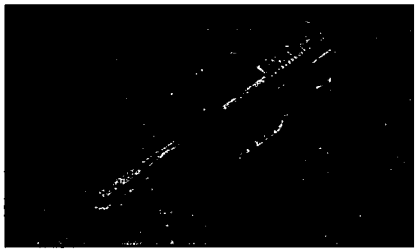
Left to right: Plungers and Seals for Shimadzu LC-600/LC-9A, LC-10AS, LC-6A

Shimadzu LC-600/LC-9A, LC-10AD, ESA Model 580

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SEAL	34-36-00857	UHMWPE/Elastomer Energized Seal	228-18745-00	[illegible]
SEAL 10/Pk	34-36-00858	UHMWPE/Elastomer Energized Seal 10/Pk	[illegible]	[illegible]

Shimadzu LC-10AS, LC-10AT

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
OPTI-SEAL®	34-36-00865	OPTI-SEAL® UHMWPE Back-Up Seal	228-28499-00	[illegible]
O-S 10/Pk	34-36-00866	OPTI-SEAL UHMWPE Back-Up Seal 10/Pk	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]



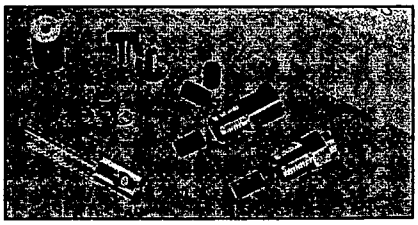
Universal Plunger for Shimadzu LC-10AT

* See Facing Page for more information.

Don't let unexpected pump malfunctions catch you by surprise! Optimize offers HPLC First Aid Kits™ equipped with a complete set of precision components for your Shimadzu pump, giving you rapid access to the parts you need to keep your system running. We also offer Fittings Kits which contain a useful selection of fittings, unions and plugs, value-priced and specifically tailored to your HPLC pump. See pages 46-47 for more information about accessory kits from Optimize.

Accessory Kits

Type	OPTI-Part #	Description	Price
1st AID KIT	34-08-00851	HPLC First Aid Kit, LC-6A	
1st AID KIT	34-08-00852	HPLC First Aid Kit, LC-600/LC-9A, LC-10AD, ESA Model 580	
1st AID KIT	34-08-00887	HPLC First Aid Kit, LC-10AS	
1st AID KIT	34-08-02048	HPLC First Aid Kit, LC-10AT	
FIT KIT	34-08-00850	Fittings Kit, All Shimadzu	



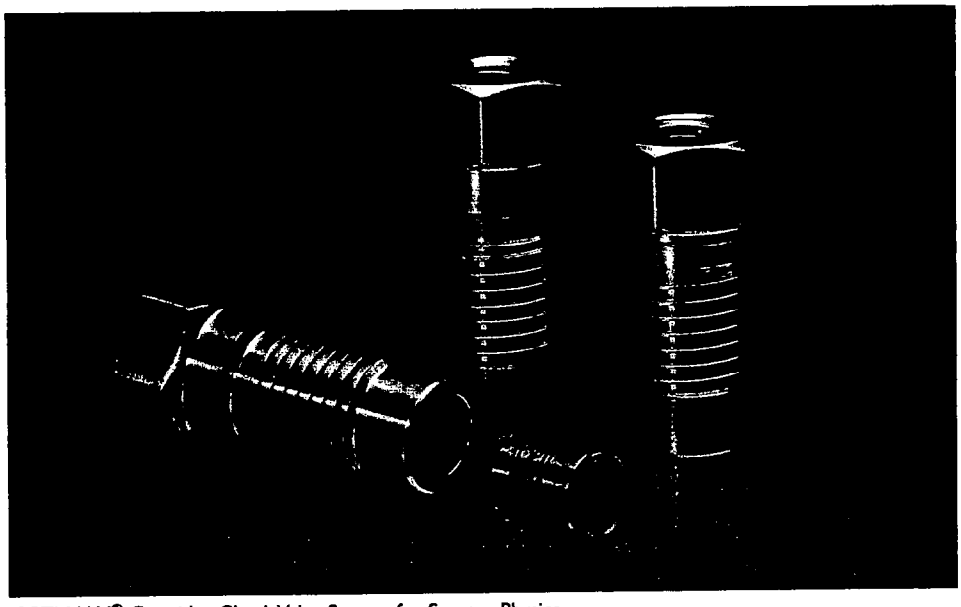
HPLC First Aid Kit™ for LC-6A

SPECTRA-PHYSICS

For maximum performance and proven reliability, choose OPTI-MAX® Cartridge Check Valves for your Spectra-Physics HPLC system. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom-designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one.

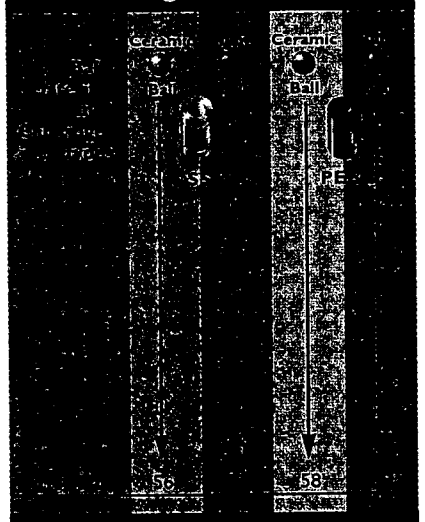
OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See pg. 41 for more information.



OPTI-MAX® Cartridge Check Valve System for Spectra-Physics

Recommended cartridge

OPTI-MAX Cartridge Code Chart



We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the right. See page 41 for more information

OPTI-MAX® Cartridge Check Valves

Spectra-Physics 8700, 8800, 8810, IsoChrom™, P-Series

Type	OPTI-Part #	Description	OEM #	Price
INLET	35[illegible]00956	OPTI-MAX Inlet Housing & Cartridge *All Above Pump Models	A3495-010	
OUTLET	35[illegible]00961	OPTI-MAX Outlet Housing & Cartridge 8700, 8800, 8810, IsoChrom Pumps	A3490-010	
TRANSDUCER	35[illegible]00952	OPTI-MAX Transducer Housing & Cartridge P-Series Pumps	A3990-010	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk		

number from this chart to select the cartridge type you need.

For those who prefer purchasing standard check valve assemblies or repairing check valves with rebuild kits, we offer these precision-machined replacement parts, guaranteed to meet or exceed OEM specifications.

Standard Check Valves

Spectra-Physics 8700, 8800, 8810, IsoChrom™, P-Series

Type	OPTI-Part #	Description	OEM #	Price
INLET	35-38-00945	Tested Inlet (All Above Pump Models)	A3495-010	
	35-38-00940	Inlet Conversion Kit (Inlet & Tube Assembly)	A3485-010	
	35-38-00943	Check Valve Tube Assembly (For Inlet)		
TRANSDUCER	35-38-00944	Tested Transducer, P-Series	A3990-010	
OUTLET	35-38-00949	Tested Outlet (8700, 8800, 8810, IsoChrom)	A3490-010	
	35-38-00941	Check Valve Tube Assembly (For Outlet)	A3479-010S	
REBUILD	35-38-00951	Rebuild Kit All Above Pump Models (Rebuilds 2)		

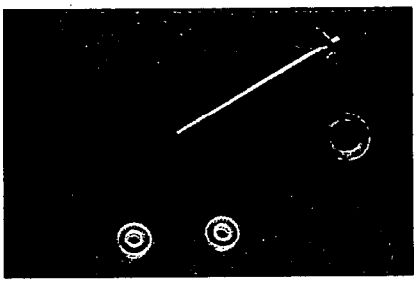
Tested Inlet Check Valve

Tested Transducer Check Valve for Spectra-Physics P-Series Pumps

Tested Outlet Check Valve for Spectra-Physics 8700, 8800, 8810 and IsoChrom Pumps

Replacement seals and pistons from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.

Seals and Pistons



Spectra-Physics 8800, 8810, IsoChrom, P-Series

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
TFB™	35-36-00928	TFB PTFE Piston Seal	A2962-010	
TFB 10/Pk	35-36-00938	TFB PTFE Piston Seal 10/Pk		
[illegible]	[illegible]	[illegible]	[illegible]	

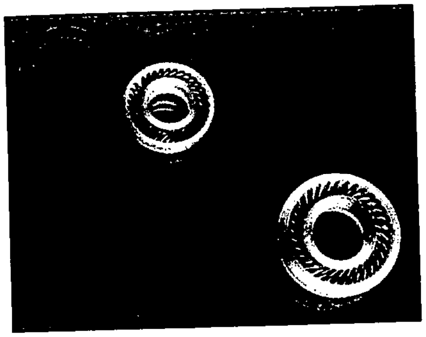
Spectra-Physics 8800, 8810, IsoChrom, P-Series (Flush Seal)

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
TFB™	35-36-00920	TFB PTFE Flush Seal	A2963-010	
TFB 10/Pk	35-36-00921	TFB PTFE Flush Seal 10/Pk		

See next page for more Seals and Pistons

SPECTRA-PHYSICS

Replacement seals and pistons from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.



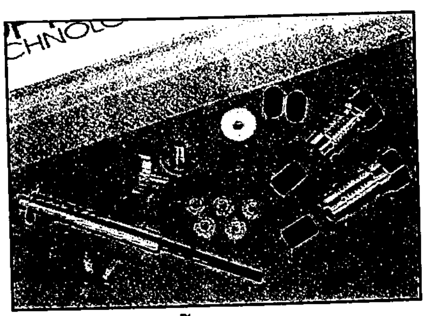
Seals and Pistons

Spectra-Physics 8700, 8700XR, 8750

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
TFB 2/Pk	35-36-00936	TFB PTFE Piston Seal	A1703-020	
TFB 10/Pk	35-36-00937	TFB PTFE Piston Seal, 10/Pk		

Spectra-Physics 8000

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BACK-UP	35-36-00916	Back-Up Seal, PEEK	A2973-010	
B-S 10/Pk	35-36-00917	Back-Up Seal, PEEK, 10/Pk		



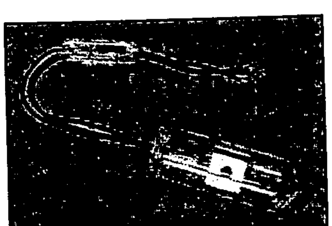
HPLC First Aid Kit™

Don't let unexpected pump malfunctions catch you by surprise! Optimize offers HPLC First Aid Kits™ equipped with a complete set of precision components for your Spectra-Physics pump, giving you rapid access to the parts you need to keep your system running. We also offer Fittings Kits which contain a useful selection of fittings, unions and plugs, value-priced and specifically tailored to your HPLC pump. See pages 46-47 for more information about accessory kits from Optimize.

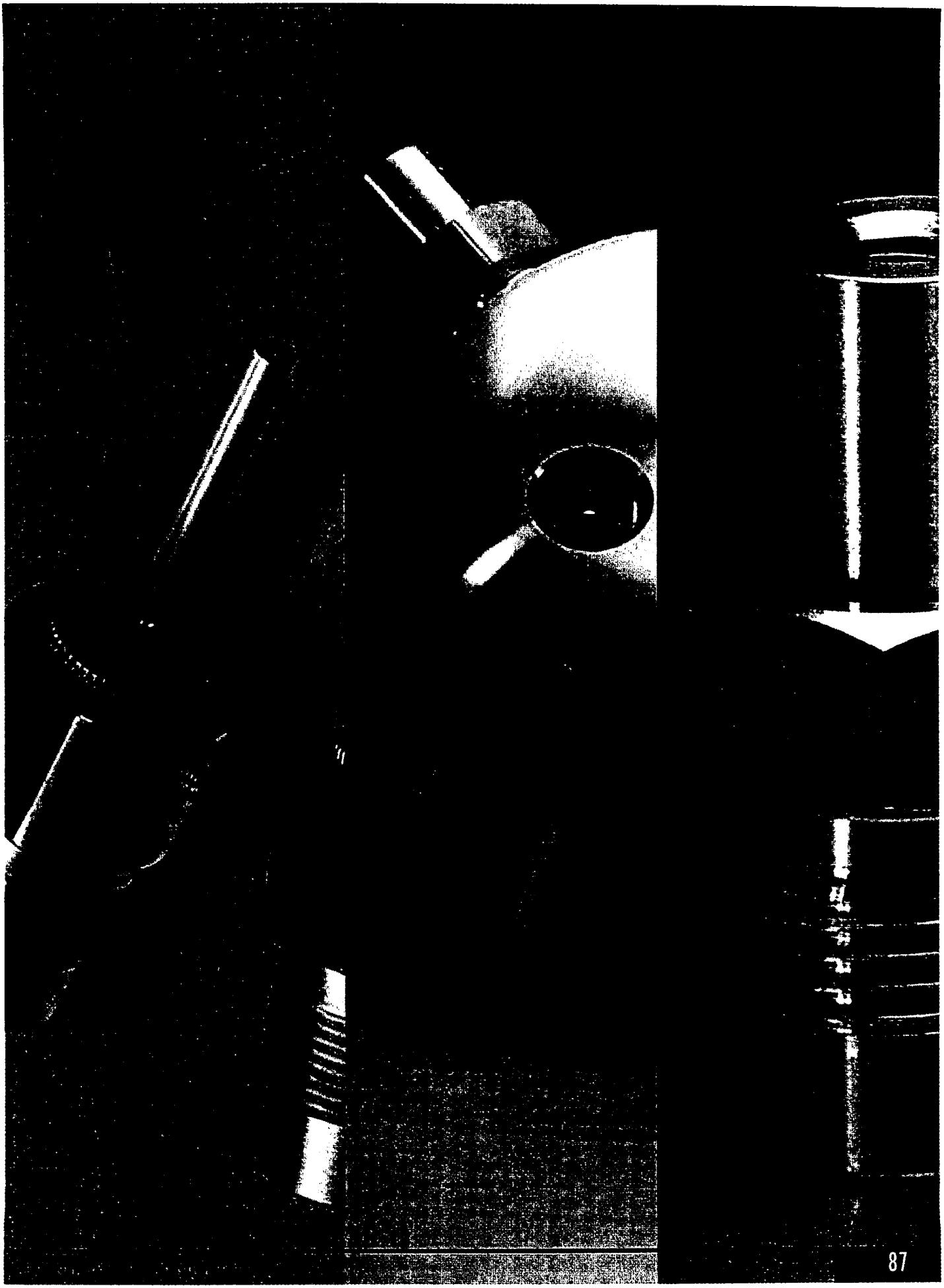
For your convenience, we offer these replacement lamps for your UV detector, which are guaranteed to meet or exceed original manufacturer's specifications.

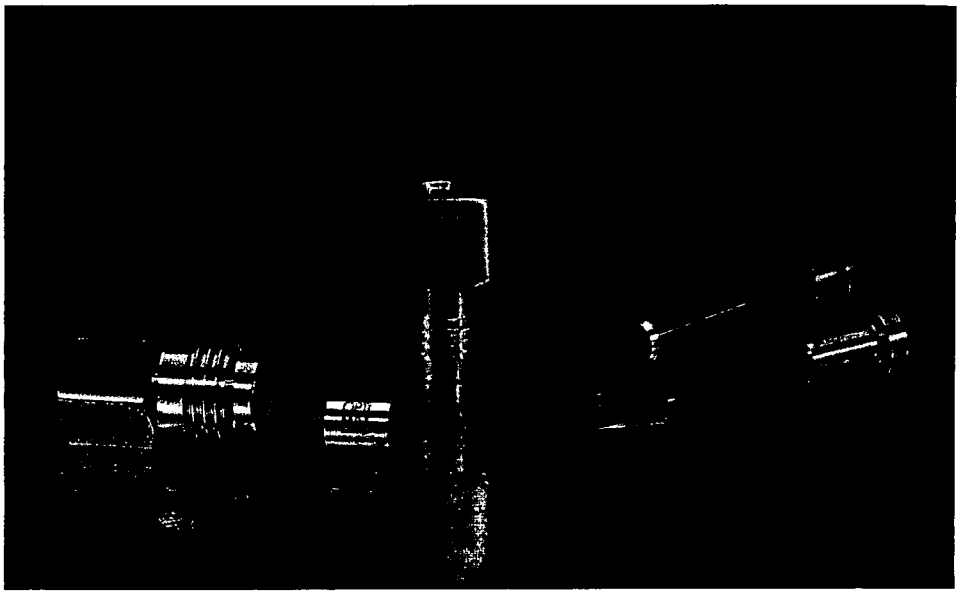
Accessory Kits

Type	OPTI-Part #	Description	OEM #	Price
1st AID KIT-S	35-08-00914	HPLC First Aid Kit, 8800, 8810, IsoChrom™		
1st AID KIT	35-08-01334	HPLC First Aid Kit, P-Series		
FIT KIT	35-08-00432	Fittings Kit (Rheodyne Injection Valve)		
FIT KIT	35-08-00913	Fittings Kit (Valco Injection Valve)		
LAMP	35-32-01295	Deuterium Lamp, SP-8450 Detector	A1480-010	
LAMP	35-32-01333	SP Focus Detector Lamp, Normal	9551-0023	



Deuterium Lamp

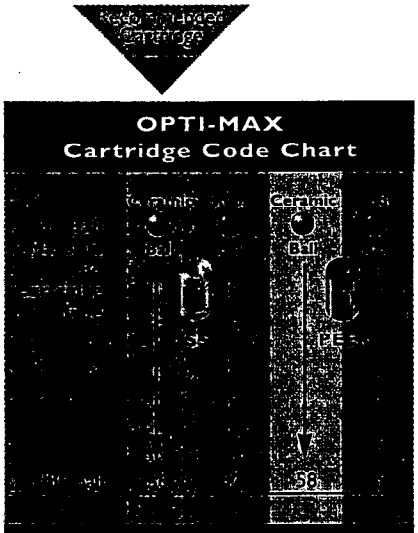




OPTI-MAX® Cartridge Check Valve System and Pistons for SSI

For maximum performance and proven reliability, choose OPTI-MAX Cartridge Check Valves for your SSI HPLC system. These OPTI-MAX also fit BAS PM-48 and ESA 5700 SDM and DuPont 8800 pumps. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom-designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one. OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See page 41 for more information.



We recommend the SS Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the right. See page 41 for more information.

OPTI-MAX® Cartridge Check Valves

SSI 200 Series, Model 300

Type	OPTI-Part #	Description	OEM #	Price
INLET	36[illegible]00982	OPTI-MAX Inlet Housing & Cartridge	02-0162	
OUTLET	36[illegible]00987	OPTI-MAX Outlet Housing & Cartridge	02-0163	
CARTRIDGE	10-[illegible]02004	OPTI-MAX Replacement Cartridges 1/8" Ball 2/Pk		

number from this chart to select the cartridge type you need.

For those who prefer repairing check valves with rebuild kits, we offer these precision-machined replacement parts, guaranteed to meet or exceed OEM specifications.

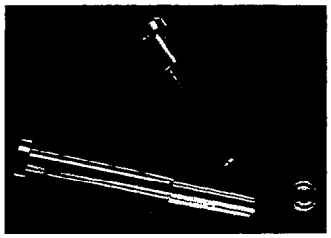
Standard Check Valve Rebuild Kits

SSI 200 Series, Model 300

Type	OPTI-Part #	Description	OEM #	Price
REBUILD	36-38-00981	Rebuild Kit (Rebuilds 2)	12-0167	

Replacement seals and pistons from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.

Seals and Pistons



SSI 200 Series, Model 300

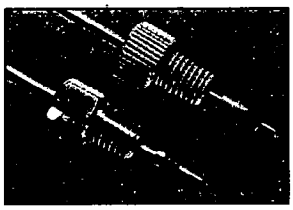
Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]		
ITB	36-36-01299	ITB PTFE Piston Seal	90-1012	
ITB, 10/Pk	36-36-01300	ITB PTFE Piston Seal, 10/Pk		
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	

Don't let unexpected pump malfunctions catch you by surprise! Optimize offers HPLC First Aid Kits™ equipped with a complete set of precision components for your SSI pump, giving you rapid access to the parts you need to keep your system running. We also offer Fittings Kits which contain a useful selection of fittings, unions and plugs, value-priced and specifically tailored to your HPLC pump. See pages 46-47 for more information about accessory kits from Optimize.

Manufactured by Optimize Technologies, these SSI style fittings are machined from type 316 passivated stainless steel and PEEK.

Accessory Kits and Fittings

Type	OPTI-Part #	Description	Price
1st AID KIT	36-08-00968	HPLC First Aid Kit, 200 Series (with self-flushing option)	
1st AID KIT	36-08-00967	HPLC First Aid Kit, 200 Series (without self-flushing option)	
FIT KIT	36-08-00621	Fittings Kit	
	36-24-00969	1/4-28 Nut For 1/16" OD Tubing	
	36-24-01674	Ferrule, SS For 1/16" OD Tubing	
	36-24-00970	Nuts (36-24-00969) and SS Ferrules (36-24-01674), 10/Pk	
	10-20-00269	OPTI-LOK 6K Double-Tight Ferrule, PEEK	
	10-20-00330	OPTI-LOK 6K 1/4-28 Hand-Tight Nut, PEEK	
	10-20-00331	OPTI-LOK 6K Hand-Tight Nuts (10-20-00330) and 6K Double-Tight PEEK Ferrules (10-20-00269), 10/Pk	

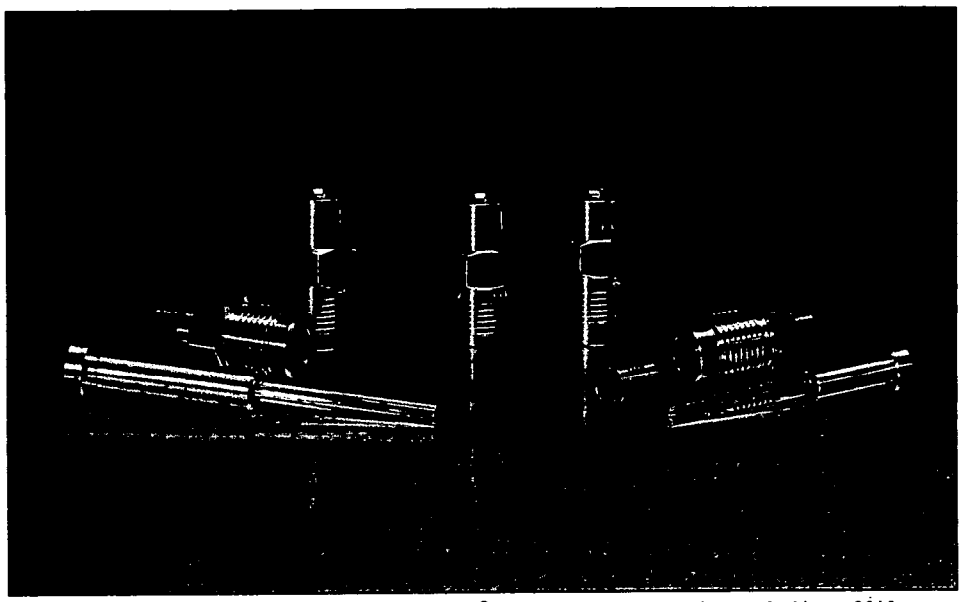


VARIAN

For maximum performance and proven reliability, choose OPTI-MAX® Cartridge Check Valves for your Varian HPLC system. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom-designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one. Innovative Free-Turn™ housings let you switch cartridges without removing your connecting tubing.

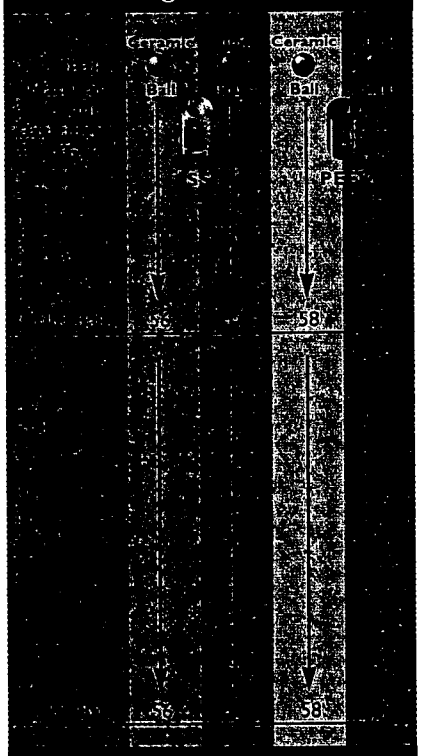
OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See pg. 41 for more information.



Left to Right: Piston for Varian 2010/2510, OPTI-MAX® Cartridge Check Valve System for Varian 2010 (Inlet and Outlet), Varian 2510 (Inlet and Outlet), Varian 9000 Star (Outlet), and Piston for Varian 9000 Star

Recommended Cartridge

OPTI-MAX Cartridge Code Chart



We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the right. See page 41 for more information.

OPTI-MAX® Cartridge Check Valves

Varian 2010 FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
INLET	38[illegible]01038	OPTI-MAX Inlet Housing & Cartridge	00-997261-09	
OUTLET	38[illegible]01043	OPTI-MAX Outlet Housing & Cartridge	00-997261-10	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/8", Ball, 2/Pk		

[illegible] number from this chart to select the cartridge type you need.

Varian 2510 & Varian 9000 Star FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
INLET	38[illegible]01544	OPTI-MAX Inlet Housing & Cartridge, 2510	00-997554-19	
OUTLET	38[illegible]01546	OPTI-MAX Outlet Housing & Cartridge, 2510	00-997554-18	
OUTLET	38[illegible]01[illegible]06	OPTI-MAX Outlet Housing & Cartridge, 9000 Star	00-[illegible]	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/8", Ball, 2/Pk		

[illegible] number from this chart to select the cartridge type you need.

For those who prefer purchasing standard check valve assemblies or repairing check valves with rebuild kits, we offer these precision-machined replacement parts, guaranteed to meet or exceed OEM specifications.

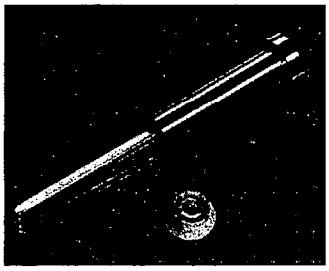
Standard Check Valves

Varian 2010

Type	OPTI-Part #	Description	OEM #	Price
INLET	38-38-01016	Tested Inlet	00-99726-09	
OUTLET	38-38-01021	Tested Outlet	00-99726-10	
REBUILD	38-38-01023	Rebuild Kit (Rebuilds 2)		

Replacement seals and pistons from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.

Seals and Pistons



Varian 2010, 2510

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
ITB	38-36-01002	ITB PTFE Piston Seal	00-99726-07	
ITB 10/Pk	38-36-01008	ITB PTFE Piston Seal, 10/Pk		
[illegible]	[illegible]	[illegible]		
PISTON	38-34-00999	Sapphire Piston	00-99726-08	

Varian 9000 Star

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]		
ITB	38-36-01053	ITB PTFE Piston Seal		
ITB 10/Pk	38-36-01054	ITB PTFE Piston Seal, 10/Pk		
[illegible]	[illegible]	[illegible]		

Don't let unexpected pump malfunctions catch you by surprise! Optimize offers HPLC First Aid Kits™ equipped with a complete set of precision components for your Varian pump, giving you rapid access to the parts you need to keep your system running. We also offer Fittings Kits which contain a useful selection of fittings, unions and plugs, value-priced and specifically tailored to your HPLC pump. See pages 46-47 for more information about accessory kits from Optimize.

Accessory Kits

Type	OPTI-Part #	Description	Price
1st AID KIT	38-08-00998	HPLC First Aid Kit, 2010	
1st AID KIT	38-08-02047	HPLC First Aid Kit, 2510	
1st AID KIT	38-08-02049	HPLC First Aid Kit, 9000 Star	
FIT KIT	38-08-00913	Fittings Kit (Valco Injection Valve)	
FIT KIT	38-08-00432	Fittings Kit (Rheodyne Injection Valve)	

OPTI-MAX® Cartridge Check Valve System for Waters 616, #3 Heads (Inlet) and #4/#6 Heads (Outlet)

OPTI-PRIME™ Pump Head and OPTI-MAX® Cartridge Check Valve System for Waters Pumps

For maximum performance and proven reliability, choose OPTI-MAX® Cartridge Check Valves for your Waters HPLC system. Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one. Innovative Free-Turn™ housings let you switch cartridges without removing your connecting tubing. OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See page 41 for more information.

OPTI-MAX® Cartridge Check Valves

100 µL Head [M45/45G, M501, 510, 515, 590, 600/600E, 610, 6K/6KA] FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
INLET	39[redacted]01251	OPTI-MAX Inlet Housing & Cartridge	33679	
OUTLET	39[redacted]01256	OPTI-MAX Outlet Housing & Cartridge	25216	
CARTRIDGE	10[redacted]02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk		

Microbore Head [616] FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
INLET	39[redacted]01949	OPTI-MAX Inlet Housing & Cartridge	55845 & 24960	
OUTLET	39[redacted]01950	OPTI-MAX Outlet Housing & Cartridge	55845 & 24960	
CARTRIDGE	10[redacted]02004	OPTI-MAX Replacement Cartridges, 1/16" Ball, 2/Pk		

225 µL Head (#3) [510, 590, 600/600E, 610, 650, 6K/6KA] FREE-TURN™

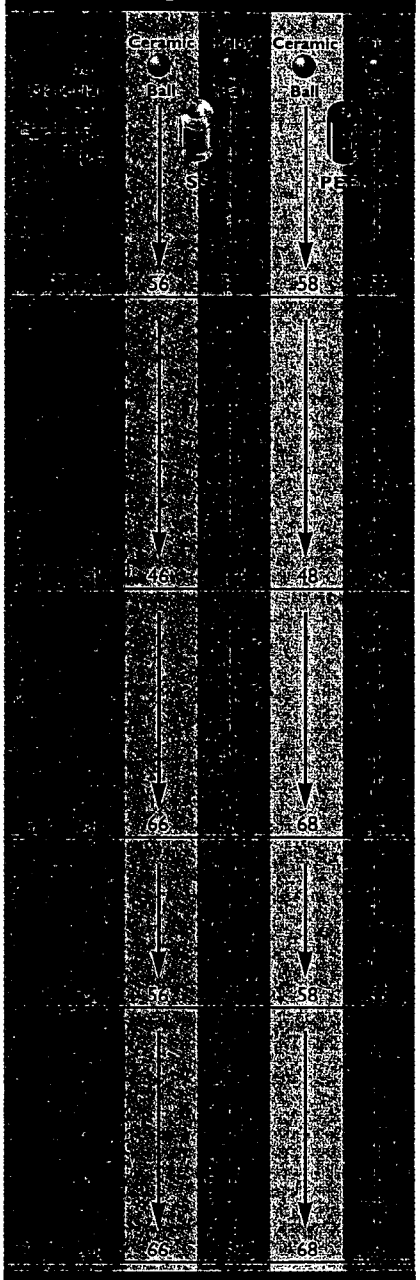
Type	OPTI-Part #	Description	OEM #	Price
INLET	39[redacted]01262	OPTI-MAX Inlet Housing & Cartridge	60307	
CARTRIDGE	10[redacted]02005	OPTI-MAX Replacement Cartridges, 3/16" Ball, 2/Pk		
OUTLET	39[redacted]01256	OPTI-MAX Outlet Housing & Cartridge	25216	
CARTRIDGE	10[redacted]02004	OPTI-MAX Replacement Cartridges, 1/8" Ball, 2/Pk		

400 µL (#4) & 900 µL (#6) Heads [Delta Prep™ 3000, 600/600E, 650] FREE-TURN™

Type	OPTI-Part #	Description	OEM #	Price
OUTLET	39[redacted]01267	OPTI-MAX Outlet Housing & Cartridge	33326	
CARTRIDGE	10[redacted]02005	OPTI-MAX Replacement Cartridges, 3/16" Ball, 2/Pk		

Recommended Cartridge

OPTI-MAX Cartridge Code Chart



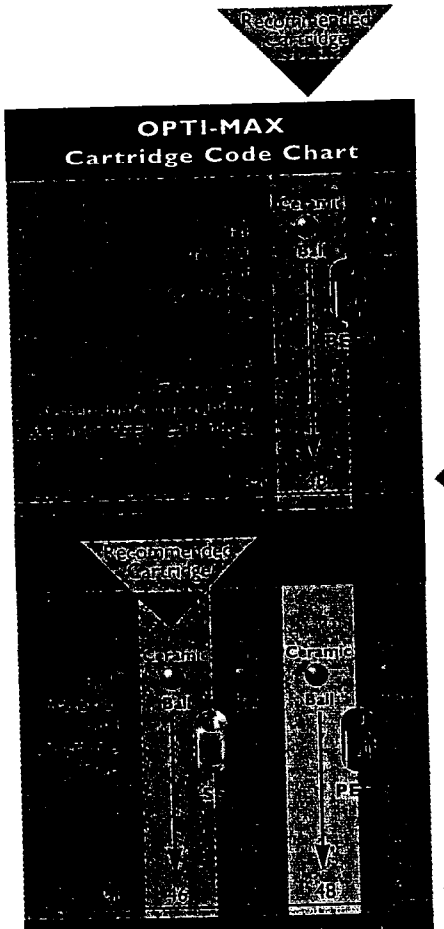
We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to your left. See page 41 for more information.

WATERS

For maximum performance and proven reliability, choose OPTI-MAX® Cartridge Check Valves for your Waters 625, 626 and Backflush HPLC Systems.

Model 625 and 626 solvent delivery systems are designed for bio-compatible applications. To maintain a bio-inert flow path in these systems, use only PEEK OPTI-MAX Cartridges with ceramic or ruby/sapphire balls and seats. To select the type of cartridge you require, use the chart below. See page 41 for more information.

OPTI-MAX® Cartridge Check Valve System for Waters 625/626 (left) and Backflush (right) Systems



OPTI-MAX® Cartridge Check Valves

625/626

Type	OPTI-Part #	Description	OEM #	Price
INLET	39[illegible]01907	OPTI-MAX Inlet Housing & Cartridge	30541 & 24120	
OUTLET	39[illegible]01909	OPTI-MAX Outlet Housing & Cartridge	30543 & 24120	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/16" Ball, 2/Pk		

[illegible] number from this chart to select the cartridge type you need.

Backflush FREE-TURN™

Type	OPTI-Part #	Description	Price
INLET	39[illegible]01979	OPTI-MAX Inlet Housing & Cartridge	
OUTLET	39[illegible]01980	OPTI-MAX Outlet Housing & Cartridge	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges, 1/16" Ball, 2/Pk	

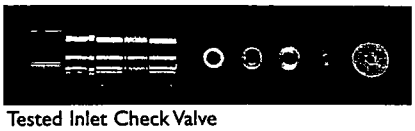
[illegible] number from this chart to select the cartridge type you need.

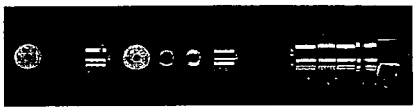
For those who prefer purchasing standard check valve assemblies or repairing check valves with rebuild kits, we offer these precision-machined replacement parts, guaranteed to meet or exceed OEM specifications.

Standard Check Valves

100 µL Head [M45/45G, M501, 510, 590, 600/600E, 610, 6K/6KA]

Type	OPTI-Part #	Description	OEM #	Price
INLET	39-38-01218	Tested Inlet 1/8"	25214	
REBUILD	39-38-01226	Rebuild Kit (Rebuilds 2)	60495	
	39-38-01451	PEEK Washer	05072	
	39-38-01221	Gasket Retainer	60435	
	39-38-01222	Insert	05077	
	39-38-01308	Ruby Ball/ Sapphire Seat, 1/8"	25306	
	39-38-01224	Washer	05090	
	39-38-01225	Inlet Housing	25203	
OUTLET	39-38-01237	Tested Ball & Seat Outlet Check Valve, 1/8"	25216	
REBUILD	39-38-01243	Rebuild Kit (Rebuilds 2)	26014	
	39-38-01239	Rulon Washer	05071	


Tested Inlet Check Valve


Tested Ball & Seat Outlet Check Valve

100 µL Head, Spring Actuator Style [510, 590, 610]

Type	OPTI-Part #	Description	OEM #	Price
OUTLET	39-38-01227	Tested Spring Actuator Outlet Check Valve	25028	
REBUILD	39-38-01236	Rebuild Kit (Rebuilds 2)	26016	
	39-38-01228	Outlet Housing	25202	
	39-38-01229	Cup Filter	05078	
	39-38-01230	Spring	05082	
	39-38-01232	Actuator	05084	
	39-38-01233	Actuator Seat PTFE	05083	
	39-38-01234	PTFE Washer	05096	

Tested Spring Actuator Outlet Check Valve

225 µL Head (#3) [510, 590, 600/600E, 610, 650, 6K/6KA]

Type	OPTI-Part #	Description	OEM #	Price
INLET	39-38-01244	Tested Extended Flow Inlet Check Valve 3/16"	60307	
	39-38-01245	Extended Flow Housing	60308	
	39-38-01246	Guide Seal	32704	
	39-38-01311	3/16" Ball & Seat	32646	
	39-38-01247	Guide	32705	
	39-38-01248	Retainer	32707	
	39-38-01321	Flexing Seal	32706	
OUTLET	39-38-01237	Tested Ball & Seat Outlet Check Valve, 1/8"	25216	
REBUILD	39-38-01243	Rebuild Kit (Rebuilds 2)	26014	
	39-38-01239	Rulon Washer	05071	

Tested Extended Flow Inlet Check Valve

Tested Ball & Seat Outlet Check Valve

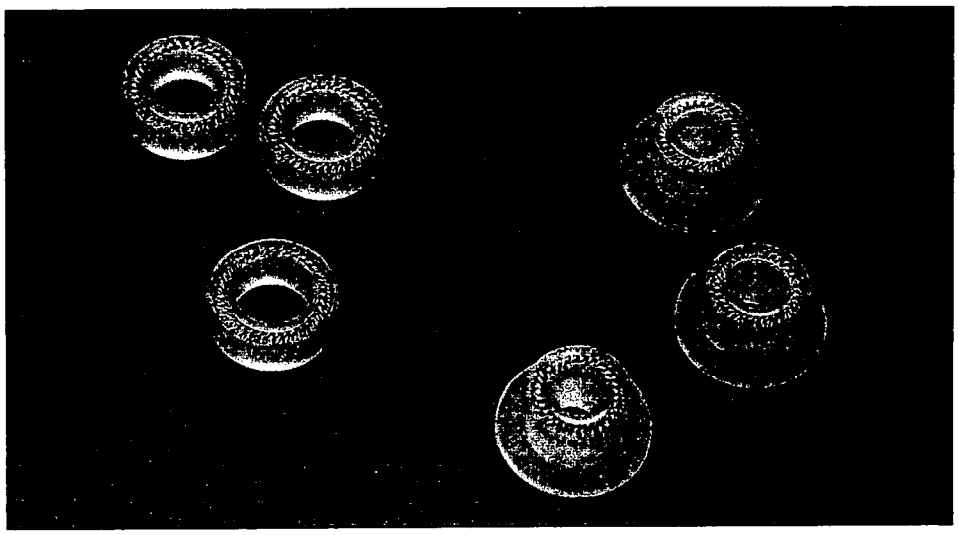
400 µL (#4) & 900 µL (#6) Heads [Delta Prep™ 3000, 600/600E, 650]

Type	OPTI-Part #	Description	OEM #	Price
OUTLET	39-38-01249	Tested Extended Flow Outlet 9/16"	33326	
REBUILD	39-38-01250	Rebuild Kit (Rebuilds 2)	88223	

Tested Extended Flow Outlet Check Valve

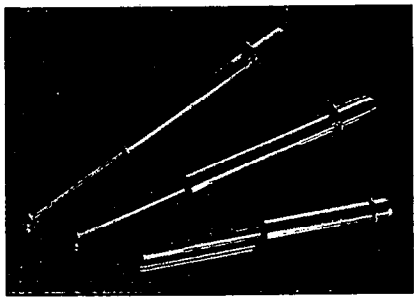
WATERS

ITB™ PTFE Plunger Seals



OPTI-SEAL® UHMW-PE Plunger Seals

Replacement seals and plungers from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.



Plungers for Waters Pumps (top to bottom: 39-34-01193, 39-34-01188 and 39-34-01191)

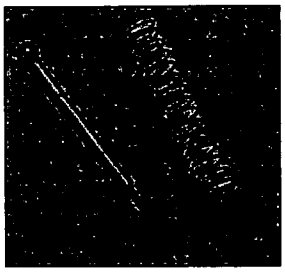
Seals and Plungers

100 µL Head [M45/45G, M501, 510, 515, 590, 600/600E, 610, 6K/6KA]

Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ITB™	39-36-01206	ITB PTFE Plunger Seal Black	26613	[illegible]
ITB™ 10/Pk	39-36-01207	ITB PTFE Plunger Seal Black 10/Pk	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ITB™	39-36-01211	ITB PTFE Plunger Seal Tan	25084	[illegible]
ITB™ 10/Pk	39-36-01213	ITB PTFE Plunger Seal Tan 10/Pk	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
PLUNGER	39-34-01191	Plunger For M45/45G M501	26524	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

225 µL Head (#3) [510, 590, 600/600E, 610, 650, 6K/6KA]

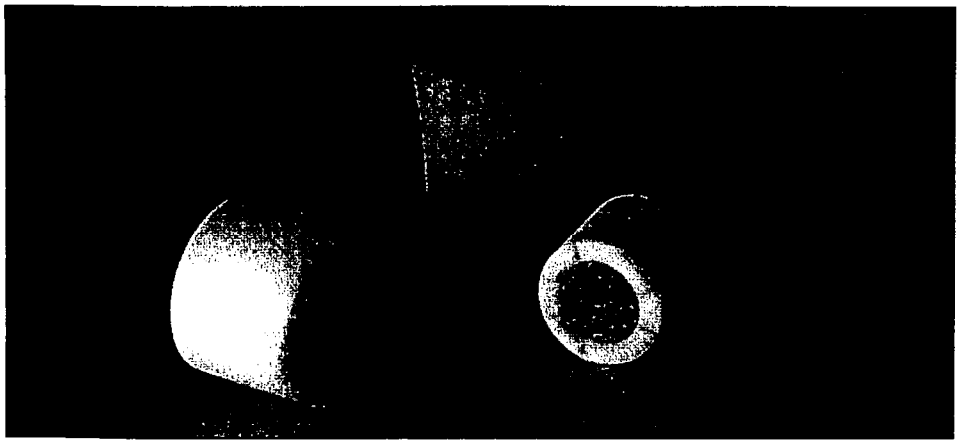
Type	OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ITB™	39-36-01214	ITB PTFE Plunger Seal Extended Flow	26614	[illegible]
ITB™ 10/Pk	39-36-01215	ITB PTFE Plunger Seal Extended Flow 10/Pk	[illegible]	[illegible]
PLUNGER	39-34-01193	Plunger	[illegible]	[illegible]

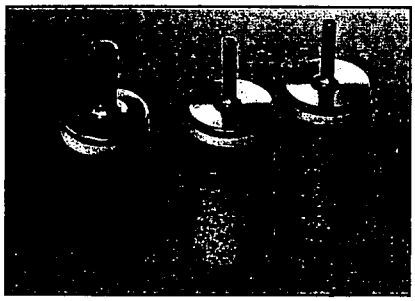


Plunger and Spring for 616 and 625/626

616, 625/626

Type	OPTI-Part #	Description	OEM #	Price
PLUNGER	39-34-01230	Plunger & Spring	[illegible]	[illegible]





Solvent Reservoir Filters with Stem

OPTI-SOLV™ Solvent Reservoir Filters (above) are made using PTFE and Titanium. Optimize Solvent Reservoir Filters with Stem (right) are made of Hastelloy C® for maximum corrosion resistance and inertness. They are an improved version of the Waters stem-type filter.

For extended flow systems, and where flow rates exceed 10mL/minute, a 10-micron filter is required, while a 2-micron filter is preferable for most analytical applications. For more information about reservoir filters, please refer to pages 14 and 15.

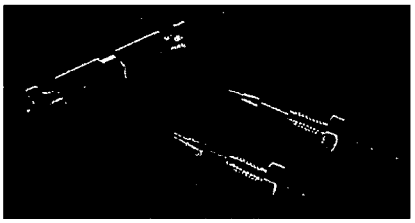
Solvent Reservoir Filters

	Solvent Reservoir Filter with Tube Stem For 1/8" ID Tubing	OPTI-SOLV Analytical Filters For 3/16" OD Tubing For 1 Liter Solvent Bottles	OPTI-SOLV Prep Filters For 3/16" OD Tubing For 4 Liter Solvent Bottles
[illegible]	[illegible]	[illegible]	[illegible]
2 Micron	10-04-00115	10-04-00050	10-04-00066
2 Micron	10-04-90119	10-04-00056	10-04-00068
10 Micron	10-04-00118	10-04-00057	10-04-00069
10 Micron	10-04-00114	10-04-00058	10-04-00070

Optimize Technologies manufactures Waters-style compression screws and ferrules exclusively from type 316 SS. Compression screws and ferrules are acid passivated for optimum chemical resistivity.

Compression Screws & Ferrules For 1/16"OD Tubing

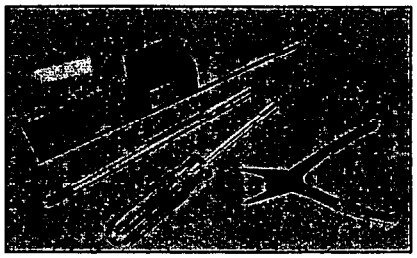
OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]
39-24-01090	Compression Screw SS	05070	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
39-24-01091	Compression Screws (39-24-01090) & Ferrules (39-24-01291) 10/PK	25604	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]



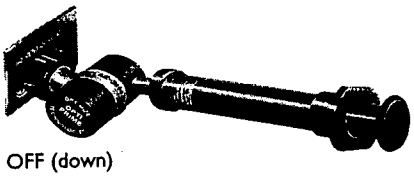
Designed specifically for Waters, these tools help increase the ease and safety of pump repairs.

Specialty Tools

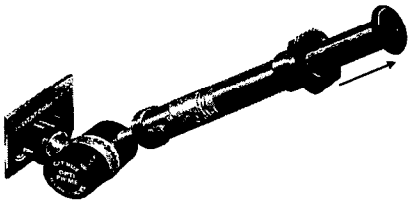
OPTI-Part #	Description	OEM #	Price
39-10-01077	Plunger Insertion Tool	11042	
39-10-01083	Seal Forming Tool	76765	
39-10-01078	Foot Vise for Waters Pump Heads		
39-10-01085	Slotted Nut Driver for 1/16" Compression Screws	76374	
39-10-01084	Clip Ring Pliers	25263	
39-10-01086	Waters Specialty Tool Kit (Includes one each of the above tools)		



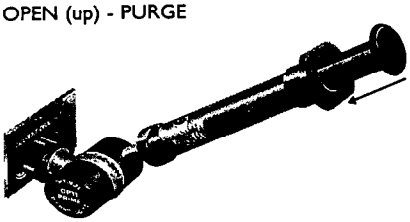
WATERS



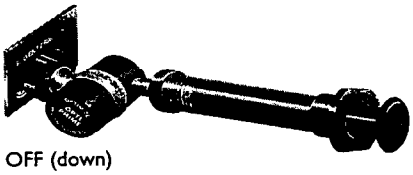
OFF (down)



OPEN (up) - PURGE

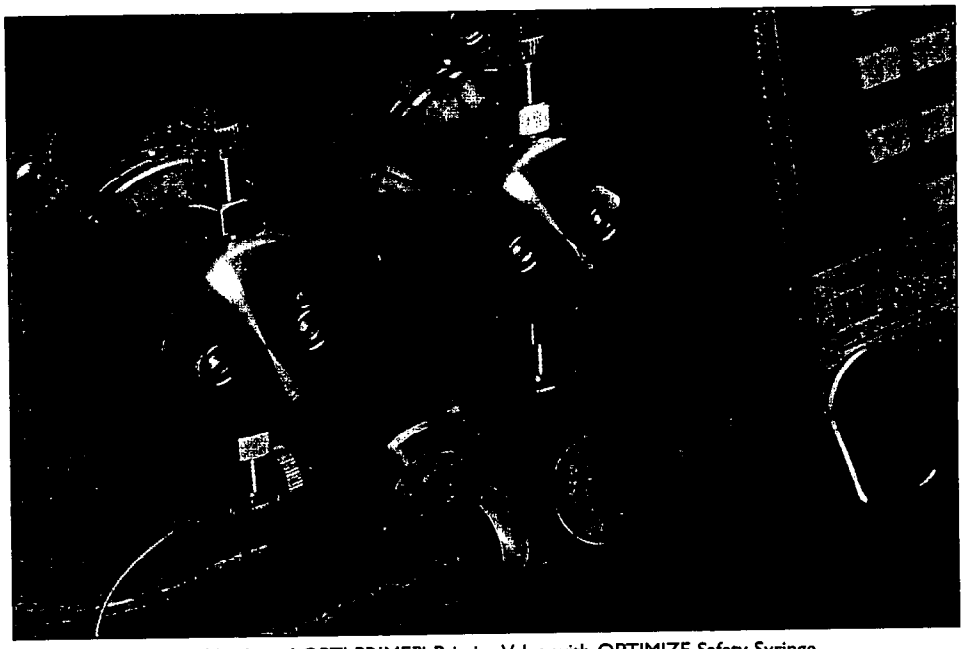


OPEN (up) - PRIME



OFF (down)

Prime your Waters Pump in four easy steps!



OPTI-PRIME™ Pump Heads and OPTI-PRIME™ Priming Valve with OPTIMIZE Safety Syringe

Are you tired of repeating the frustrating procedure of priming your Waters analytical pump? Are you having nightmares about 17 gauge, stainless steel, blunt tip, luer hub needles with ferrules swaged on them? Then you need an OPTI-PRIME Priming Valve. OPTI-PRIME reduces the priming procedure to a simple task that takes only seconds. An easy, one-time installation eliminates wear and tear on the seal insert; there is no need to use the standard draw-off tube, or to cut a piece of Teflon® tubing and force it over the stem.

Wetted Materials: PPS, PTFE, and 316 Stainless Steel — the OPTI-PRIME valve is inert to all commonly used HPLC solvents.

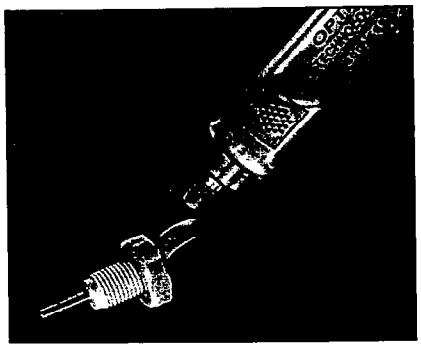
Single-Handed Operation: After the valve is tightened and in the off (down) position, attach the syringe to the luer adapter. Rotating the syringe upward turns the valve to the open position.

No Need to Remove the Syringe During Priming: The innovative design of the OPTI-PRIME valve allows it to rotate upward, letting the air rise naturally to the top of the syringe. This eliminates the need to remove the syringe to expel air once solvent reaches it.

No Air Is Injected Into Your Pump: Simply stop pushing on the syringe plunger before air reaches the valve. After priming is complete, rotate the syringe back down. The valve is now closed and the syringe can be removed.

Fits Single Solvent Pumps: M45/45G, M501, 510, 590, 600/600E, and 610.

Fits Multiple Solvent Inlet Pumps: 6K/6KA.



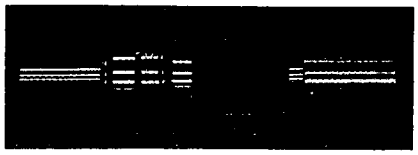
OPTI-PRIME™ Priming Valve

OPTI-PRIME™ Priming Valve U.S. PAT. NO. 5,616,300

OPTI-PART #	Description	Price
39-31-01-157	OPTI-PRIME Priming Valve	
39-31-01-170	OPTI-PRIME Priming Valve with OPTIMIZE Safety Syringe	
39-31-01-171	OPTIMIZE Safety Syringe	

The simplicity of our OPTI-DRAW™ Draw-Off Tube Assembly makes priming a Waters pump fast and trouble-free. Just push the priming syringe directly onto the OPTI-DRAW adapter. You can use any luer tip syringe to prime the pump without installing extra parts.

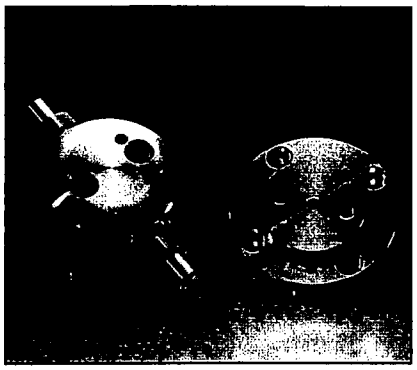
The OPTI-PRIME™ Pump Head primes easier, and eliminates many of the bubble trapping problems formerly associated with Waters pumps. Our Fluid Upgrade Kit upgrades all 6K and 6KA pumps with rectangular heads to new OPTI-PRIME™ heads with OPTI-MAX® Check Valves.



OPTI-DRAW™ Draw-Off Tube with Adapter

Pump Priming Accessories

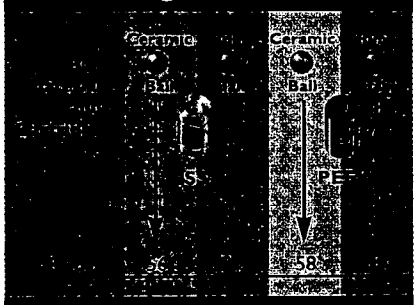
OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	[illegible]
39-31-01156	OPTI-DRAW Draw-Off Tube with PEEK Luer Adapter	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
39-31-01147	Needle with Nut & Ferrule	25559	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
39-31-01151	Priming Syringe Kit, OPTIMIZE Safety Syringe, Needle, Nut & Ferrule	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
39-31-01137	Pump Head Support Bushing, All Round Heads	25253	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
39-[illegible]-01135	OPTI-PRIME Pump Head with OPTI-MAX® Cartridge Check Valves	60058	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]



OPTI-PRIME™ Pump Head and Bushing

Recommended Cartridge

OPTI-MAX Cartridge Code Chart

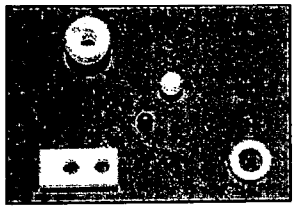


We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the left. See page 41 for more information.

Manufactured by Optimize Technologies, these replacement parts meet or exceed the specifications of those supplied by Waters and have been designed to improve performance and serviceability.

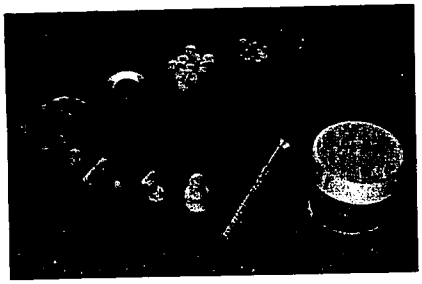
Inlet Manifold Rebuild Parts

OPTI-Part #	Description	OEM #	Price
39-31-01144	Ball Plug	05061	
39-31-01145	Rectangular Draw-Off Seal, 6K/6KA	05087	
39-31-01293	Threaded Seal Insert, M45/45G, M501, 510, 590, 600/600E & 610	05098	
39-31-01143	Ruby Ball	05089	
39-38-01233	Actuator Seal, PTFE	25681	
39-31-01133	Oil Seal, 6KA	05081	
39-31-01174	Inlet Manifold Rebuild Kit, M45/45G, M501, 510, 590, 600/600E & 610 Contains one each of the above parts (except 39-31-01145)		

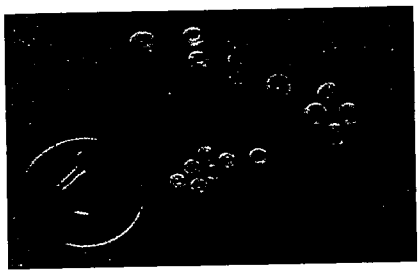


Inlet Manifold Rebuild Kit

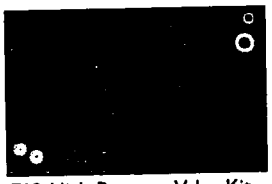
WATERS



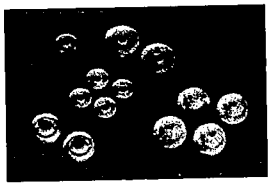
WISP™ Fluid Pack Kit



712 Injector Kit (Old Style)



712 High Pressure Valve Kit



715, 717 Seal Pack Kit

Manufactured by Optimize Technologies, these replacement parts meet or exceed the specifications supplied by Waters, and will improve performance and serviceability.

WISP™ Rebuild Kits

WISP™ Fluid Pack Rebuild Kit

39-30-01128 WISP Fluid Pack Rebuild Kit Parts and Instructions to Rebuild 710 High and Low Pressure Valves and 710 Injector

OPTI-Part #	QTY	Description	OPTI-Part #	QTY	Description
39-30-01095	4	Black Liquid Seal	39-30-01104	1	Syringe Barrel Seal
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Syringe Plunger [illegible]
39-30-01099	10	White Liquid Seal	39-30-01106	2	Needle Wash Frit
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-30-01102	2	LPV PTFE Washer	39-30-01109	1	White Lithium Grease
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

712 Injector (Old Style) Rebuild Kit

39-30-01129 WISP 712 Injector Rebuild Kit OEM # 34497

Parts and Instructions to rebuild Old Style 712 Injector

OPTI-Part #	QTY	Description	OPTI-Part #	QTY	Description
39-24-01090	1	Compression Screw	39-30-01116	1	712 WISP Needle
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-30-01111	1	Lower Wash Spacer	39-30-01119	6	712 Gasket
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-30-01114	2	PTFE Washer	39-24-01129	1	Ferrule
[illegible]	[illegible]	[illegible]			

712 High Pressure Valve Rebuild Kit

39-30-01131 Kit for 712 High Pressure Valve OEM # 15697

Parts and Instructions to rebuild the WISP 712 High Pressure Valve

OPTI-Part #	QTY	Description	OPTI-Part #	QTY	Description
39-30-01117	1	712 Air Seal	39-30-01122	1	Air Sleeve O-Ring
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-30-01121	2	Port Block Hsng O-Ring	39-30-01125	2	WISP Solvent Seal Long

715, 717 Seal Pack Assembly Rebuild Kit

39-30-01132 715, 717 Seal Pack Assembly Rebuild Kit

Parts and Instructions to rebuild the WISP 715, 717 Seal Pack

OPTI-Part #	QTY	Description	OPTI-Part #	QTY	Description
39-30-01106	4	Needle Wash Frit	39-30-01119	4	Gasket
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-30-01114	1	Small PTFE Washer	39-30-02058	1	Lower Wash Spacer

PEEK (top) and SS (bottom) OPTI-SOLV™ In-Line Filters

Eliminate reproducibility errors by replacing the Waters supplied in-line filter in your WISP system with the OPTI-SOLV™ In-Line Solvent filter. For more information, see page 12.

OPTI-SOLV™ In-Line Solvent Filter

OPTI-Part #	Description	Price	OPTI-Part #	Description	Price
10-04-00386	0.5 µm PEEK Hand-Tight		10-04-00391	2 µm PEEK Hand-Tight	
10-04-00383	0.5 µm SS Wrench Tight		10-04-00390	2 µm SS Wrench Tight	
10-04-00100	0.5 µm Replacement Frits 10/Pk		10-04-00103	2 µm Replacement Frits 10/Pk	

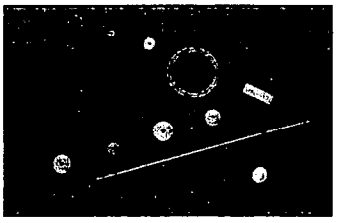
100 OPTIMIZE TECHNOLOGIES For Technical Support Call 800-669-9015

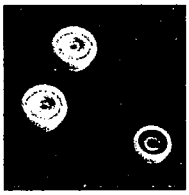
WISP™ components manufactured by Optimize Technologies are equivalent to those supplied by Waters. Dimensions and materials conform to precise specifications to guarantee the highest possible performance.

WISP™ Sample Processor Replacements

OPTI-Part #	Description	OEM #	Price
[illegible]	[illegible]	[illegible]	
39-30-01095	Liquid Seal Black	05101	
[illegible]	[illegible]	[illegible]	
39-30-01099	Liquid Seal White	05112	
[illegible]	[illegible]	[illegible]	
39-30-01104	Syringe Barrel Seal	77347	
[illegible]	[illegible]	[illegible]	
39-30-01111	Spacer Lower Needle Washer	05134	
[illegible]	[illegible]	[illegible]	
39-30-01114	PTFE Washer	05135	
[illegible]	[illegible]	[illegible]	
39-30-01116	WISP Needle 712, 715 and 717	77233	
[illegible]	[illegible]	[illegible]	
39-30-01118	PTFE O-Ring 712 HPV	[illegible]	
[illegible]	[illegible]	[illegible]	
39-30-01125	WISP Solvent Seal Long	[illegible]	

250 µL WISP Syringe

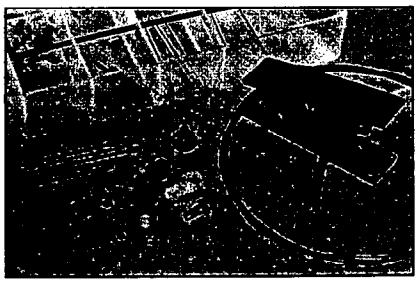

WISP Replacement Parts

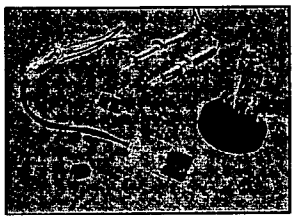

WISP Seals

Don't let unexpected pump malfunctions catch you by surprise! Optimize offers HPLC First Aid Kits™ equipped with a complete set of precision components for your Waters pump, giving you rapid access to the parts you need to keep your system running. We also offer Fittings Kits which contain a useful selection of fittings, unions and plugs, value-priced and specifically tailored to your HPLC pump. See pages 46-47 for more information about accessory kits. Replacement lamps your UV detector are guaranteed to meet or exceed original manufacturer's specifications.

Accessory Kits and Lamps

OPTI-Part #	Description		OEM #	Price
1st AID KIT	39-08-01073	HPLC First Aid Kit, 100 µL Head [M45/45G, M501]		
1st AID KIT	39-08-01074	HPLC First Aid Kit, 100 µL Head [510, 590, 600/600E, 610, 6K/6KA]		
1st AID KIT	39-08-01076	HPLC First Aid Kit, 225 µL Head (#3) [510, 590, 600/600E, 610, 650, 6K/6KA]		
1st AID KIT	39-08-01075	HPLC First Aid Kit, 225 µL Head (#3) [510, 590, 600/600E, 610, 650, 6K/6KA] (Flow Rates > 10mL/min)		
FIT KIT	39-08-01072	Fittings Kit for Waters Pumps		
LAMP	39-32-01175	Mercury Lamp, 440 & 441	97323	
LAMP	39-32-01176	Zinc Lamp, 441	97723	
LAMP	39-32-01177	Cadmium Lamp, 441	97731	
LAMP	39-32-01178	Quartz Lamp, 150C	75631	
LAMP	39-32-01179	Deuterium Lamp, 484	80357	
LAMP	39-32-01180	Source Lamp, 401	48419	
LAMP	39-32-01185	Incandescent Lamp, 5/PK	05093	
LAMP	39-32-01187	Deuterium Lamp, 486	80678	
LAMP	39-32-01294	Deuterium Lamp, 450	98946	
LAMP	39-32-01295	Source Lamp, 480 & 481	99499	


Fittings Kit


Lamps for Waters Detectors

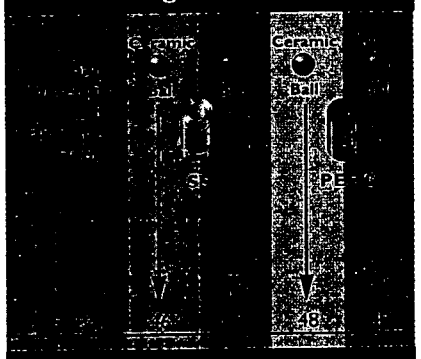
OTHER BRANDS

For maximum performance and proven reliability, choose OPTI-MAX® Cartridge Check Valves for your HPLC system. Universal OPTI-MAX cartridges function as both inlet and outlet check valves, and fit multiple pump models (and brands) using custom designed housings.

Replacing check valves is a snap — just remove the housing, tap out the old cartridge and put in a new one. OPTI-MAX cartridges are available in either stainless steel or PEEK, loaded with ceramic or ruby/sapphire matched ball and seat sets. Select the cartridge you require using the chart below. See page 41 for more information.

Recommended Cartridge

OPTI-MAX
Cartridge Code Chart



We recommend the SS/Ceramic OPTI-MAX cartridge for these pumps. If you prefer a different cartridge, use this chart to select it. Simply find the Cartridge Code that matches your cartridge type, and insert it in place of the CC in the OPTI-MAX part number to the right. See page 41 for more information.

OPTI-MAX® Cartridge Check Valve

Kontron 420/422 M-Head

Type	OPTI-Part #	Description	Price
INLET	45[illegible]01898	OPTI-MAX Inlet Housing & Cartridge	
OUTLET	45[illegible]01900	OPTI-MAX Outlet Housing & Cartridge	
CARTRIDGE	10[illegible]02004	OPTI-MAX Replacement Cartridges 1/16" Ball, 2Pk	

[illegible] number from this chart to select the cartridge type you need.

NOTE: We also offer the OPTI-MAX Cartridge Check Valve System for Tosoh model CPM pumps sold in the Japanese market.

Replacement seals and pistons from Optimize offer superior performance and reliability, and are designed to meet or exceed the specifications of their OEM counterparts. For more information on selecting the best seal for your application, please refer to page 42.

Seals and Pistons

Knauer M640

Type	OPTI-Part #	Description	Price
[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	

Kontron 420/422 M-Head

Type	OPTI-Part #	Description	Price
PISTON	45[illegible]01897	Piston	

Tracor

Type	OPTI-Part #	Description	Price
[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	

PRODUCT INDEX

OPTI-Part #	Description	OEM #	Price	Page #
OPTIMIZE				
[illegible]	[illegible]			[illegible]
10-02-00010	OPTI-GUARD Guard Column, C8, Yellow, 5/Pk			32
[illegible]	[illegible]			[illegible]
10-02-00018	OPTI-GUARD Guard Column, Phenyl, Green, 5/Pk			32
[illegible]	[illegible]			[illegible]
10-02-00026	OPTI-GUARD Guard Column, NH2, Red, 5/Pk			32
[illegible]	[illegible]			[illegible]
10-02-00034	OPTI-GUARD Guard Column, Cation, White, 5/Pk			32
[illegible]	[illegible]			[illegible]
10-02-01485	OPTI-GUARD 3mm Cartridge, C8, 3/Pk			33
[illegible]	[illegible]			[illegible]
10-02-01491	OPTI-GUARD 3mm Cartridge, Silica, 3/Pk			33
[illegible]	[illegible]			[illegible]
10-02-01495	OPTI-GUARD 3mm PEEK/SS Holder			33
[illegible]	[illegible]			[illegible]
[illegible]	[illegible]			[illegible]
10-04-00039	Female Solvent Reservoir Filter for 1/8" OD Tubing, 2 µm, 5/Pk			15
[illegible]	[illegible]			[illegible]
10-04-00041	Female Solvent Reservoir Filter for 1/8" OD Tubing, 10 µm, 5/Pk			15
[illegible]	[illegible]			[illegible]
10-04-00044	Female Solvent Reservoir Filter for 3/16" OD Tubing (Waters), 2 µm, 5/Pk			15
[illegible]	[illegible]			[illegible]
10-04-00046	Female Solvent Reservoir Filter for 3/16" OD Tubing (Waters), 10 µm, 5/Pk			15
[illegible]	[illegible]			[illegible]
10-04-00050	OPTI-SOLV Analytical Solvent Reservoir Filter for 1/8" OD Tubing, 2 µm, 5/Pk			14
[illegible]	[illegible]			[illegible]
10-04-00053	OPTI-SOLV Analytical Solvent Reservoir Filter for 1/8" OD Tubing, 10 µm, 5/Pk			14
[illegible]	[illegible]			[illegible]
10-04-00056	OPTI-SOLV Analytical Solvent Reservoir Filter for 3/16" OD Tubing (Waters), 2 µm, 5/Pk			14, 97
[illegible]	[illegible]			[illegible]
10-04-00058	OPTI-SOLV Analytical Solvent Reservoir Filter for 3/16" OD Tubing (Waters), 10 µm, 5/Pk			14, 97
[illegible]	[illegible]			[illegible]
10-04-00062	OPTI-SOLV Prep Solvent Reservoir Filter for 1/8" OD Tubing, 2 µm, 5/Pk			14
[illegible]	[illegible]			[illegible]
10-04-00065	OPTI-SOLV Prep Solvent Reservoir Filter for 1/8" OD Tubing, 10 µm, 5/Pk			14
[illegible]	[illegible]			[illegible]
10-04-00068	OPTI-SOLV Prep Solvent Reservoir Filter for 3/16" OD Tubing (Waters), 2 µm, 5/Pk			14, 97
[illegible]	[illegible]			[illegible]
10-04-00070	OPTI-SOLV Prep Solvent Reservoir Filter for 3/16" OD Tubing (Waters), 10 µm, 5/Pk			14, 97
[illegible]	[illegible]			[illegible]
10-04-00072	Solvent Reservoir Filter with 1/16" Tube Stem, 2 µm, 5/Pk			15
[illegible]	[illegible]			[illegible]
10-04-00074	Solvent Reservoir Filter with 1/16" Tube Stem, 10 µm, 5/Pk			15
[illegible]	[illegible]			[illegible]
10-04-00076	Female Solvent Reservoir Filter for 1/16" OD Tubing, 2 µm, 5/Pk			15
[illegible]	[illegible]			[illegible]
10-04-00078	Female Solvent Reservoir Filter for 1/16" OD Tubing, 10 µm, 5/Pk			15
[illegible]	[illegible]			[illegible]
10-04-00080	OPTI-SOLV Analytical Solvent Reservoir Filter for 1/16" OD Tubing, 2 µm, 5/Pk			14
[illegible]	[illegible]			[illegible]
10-04-00082	OPTI-SOLV Analytical Solvent Reservoir Filter for 1/16" OD Tubing, 10 µm, 5/Pk			14
[illegible]	[illegible]			[illegible]
10-04-00095	OPTI-SOLV Mini Filter, 0.5 µm, 5/Pk			13
[illegible]	[illegible]			[illegible]
10-04-00097	OPTI-SOLV Mini Filter, 2 µm, 5/Pk			13
[illegible]	[illegible]			[illegible]
10-04-00103	OPTI-SOLV Replacement Frits, 2 µm, 10/Pk			12, 100
[illegible]	[illegible]			[illegible]
10-04-00109	OPTI-LOK LP Ferrule/Filter Assembly for 1/8" OD Tubing, PEEK			23

PRODUCT INDEX

OPTI-Part #	Description	OEM #	Price	Page #
OPTIMIZE				
10-04-00113	Solvent Reservoir Filter with 1/8" Tube Stem, 10 µm			15, 97
10-04-00114	Solvent Reservoir Filter with 1/8" Tube Stem, 10 µm, 5/Pk			15, 97
10-04-00118	Solvent Reservoir Filter with 1/8" Tube Stem, 2 µm			15, 97
10-04-00119	Solvent Reservoir Filter with 1/8" Tube Stem, 2 µm, 5/Pk			15, 97
10-04-00385	OPTI-SOLV In-Line Filter, 0.5 µm, Includes Hand-Tight PEEK Holder, Fittings & 2 Filter Elements			12, 100
10-04-00386	OPTI-SOLV In-Line Filter, 0.5 µm, Includes Hand-Tight PEEK Holder, Fittings & 2 Filter Elements			12, 100
10-04-00390	OPTI-SOLV In-Line Filter, 2 µm, Includes Hand-Tight PEEK Holder, Fittings & 2 Filter Elements			12, 100
10-04-00391	OPTI-SOLV In-Line Filter, 2 µm, Includes Hand-Tight PEEK Holder, Fittings & 2 Filter Elements			12, 100
10-06-00126	30 psi Back Pressure Regulator			28
10-06-00128	30 psi Back Pressure Regulator			28
10-06-00129	100 psi Back Pressure Regulator			28
10-06-00130	100 psi Back Pressure Regulator			28
10-06-00132	External Adjustment Regulator			28
10-06-00134	External Adjustment Regulator			28
10-08-00257	Optimize Universal PEEK Fittings Kit			
10-08-00260	OPTI-LOK LP Plastic Fittings Kit			
10-10-00139	SS Tubing Cutter			27
10-10-00140	SS Tubing Cutter			27
10-12-00142	1/16" OD x .006" ID x 10 cm SS Tubing			27
10-12-00143	1/16" OD x .006" ID x 10 cm SS Tubing			27
10-12-00144	1/16" OD x .006" ID x 6 cm SS Tubing			27
10-12-00145	1/16" OD x .006" ID x 6 cm SS Tubing			27
10-12-00146	1/16" OD x .010" ID x 10 cm SS Tubing			27
10-12-00148	1/16" OD x .010" ID x 10 cm SS Tubing			27
10-12-00149	1/16" OD x .010" ID x 30 cm SS Tubing			27
10-12-00150	1/16" OD x .010" ID x 30 cm SS Tubing			27
10-12-00151	1/16" OD x .020" ID x 10 ft SS Tubing			27
10-12-00152	1/16" OD x .020" ID x 10 ft SS Tubing			27
10-12-00154	1/16" OD x .020" ID x 20 cm SS Tubing			27
10-12-00155	1/16" OD x .020" ID x 20 cm SS Tubing			27
10-12-00156	1/16" OD x .020" ID x 6 cm SS Tubing			27
10-12-00157	1/16" OD x .020" ID x 6 cm SS Tubing			27
10-12-00159	1/16" OD x .030" ID x 10 cm SS Tubing			27
10-12-00160	1/16" OD x .030" ID x 10 cm SS Tubing			27
10-12-00161	1/16" OD x .030" ID x 6 cm SS Tubing			27
10-12-00162	1/16" OD x .030" ID x 6 cm SS Tubing			27
10-12-00164	1/16" OD x .040" ID x 10 cm SS Tubing			27
10-12-00165	1/16" OD x .040" ID x 10 cm SS Tubing			27
10-12-00166	1/16" OD x .040" ID x 6 cm SS Tubing			27
10-12-00167	1/16" OD x .040" ID x 6 cm SS Tubing			27
10-13-00169	1/16" OD x .006" ID x 50 ft PEEK Tubing			27
10-13-00170	1/16" OD x .006" ID x 50 ft PEEK Tubing			27
10-13-00173	1/8" OD x .062" ID x 50 ft PEEK Tubing			27
10-13-00174	1/8" OD x .062" ID x 50 ft PEEK Tubing			27
10-13-00176	1/16" OD x .010" ID x 50 ft PEEK Tubing			27
10-13-00177	1/16" OD x .010" ID x 50 ft PEEK Tubing			27
10-13-00180	1/16" OD x .040" ID x 50 ft PEEK Tubing			27
10-13-00181	1/16" OD x .040" ID x 50 ft PEEK Tubing			27
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10-13-00190	1/16" OD x .030" ID x 50 ft PEEK Tubing			27
10-13-00191	1/16" OD x .030" ID x 50 ft PEEK Tubing			27
10-14-00193	1/16" OD x .010" ID x 50 ft Tefzel (ETFE) Tubing			26
10-14-00194	1/16" OD x .010" ID x 50 ft Tefzel (ETFE) Tubing			26
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10-14-00197	1/16" OD x .020" ID x 50 ft Tefzel (ETFE) Tubing			26
10-14-00199	1/16" OD x .030" ID x 50 ft Tefzel (ETFE) Tubing			26
10-14-00200	1/16" OD x .030" ID x 50 ft Tefzel (ETFE) Tubing			26
10-14-00202	1/8" OD x .062" ID x 50 ft Tefzel (ETFE) Tubing			26
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[illegible]	[illegible]			[illegible]
10-15-00209	.100" OD x .040" ID x 50 ft Teflon (PTFE) Tubing, Black			26
[illegible]	[illegible]			[illegible]
10-15-00213	1/16" OD x .010" ID x 50 ft Teflon (PTFE) Tubing, Black			26
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10-15-00215	1/16" OD x .010" ID x 50 ft Teflon (PTFE) Tubing, Natural			26
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10-15-00219	1/16" OD x .020" ID x 50 ft Teflon (PTFE) Tubing, Black			26
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10-15-00221	1/16" OD x .020" ID x 50 ft Teflon (PTFE) Tubing, Natural			26
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10-15-00225	1/16" OD x .030" ID x 50 ft Teflon (PTFE) Tubing, Black			26
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10-15-00227	1/16" OD x .030" ID x 50 ft Teflon (PTFE) Tubing, Natural			26
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10-15-00231	1/16" OD x .040" ID x 50 ft Teflon (PTFE) Tubing, Black			26
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10-15-00233	1/16" OD x .040" ID x 50 ft Teflon (PTFE) Tubing, Natural			26
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10-15-00237	1/8" OD x .062" ID x 50 ft Teflon (PTFE) Tubing, Black			26
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10-15-00240	1/8" OD x .062" ID x 50 ft Teflon (PTFE) Tubing, Natural			26
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10-15-00245	3/16" OD x .125" ID x 50 ft Teflon (PTFE) Tubing, Natural			26
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10-20-00256	OPTI-LOK Plug, Natural PEEK, 10/Pk			21
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10-20-00259	OPTI-LOK I, Kel-F, 10/Pk			20
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10-20-00262	OPTI-LOK 6K PEEK Union, .020" Thru			21
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10-20-00264	OPTI-LOK I, PEEK			20
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10-20-00266	OPTI-LOK Coupler, PEEK			21
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10-20-00268	OPTI-LOK 6K Male Nut, PEEK, Knurled Head			20
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10-20-00270	OPTI-LOK 6K Nuts & Ferrules, 10/Pk (10-20-00268 & 10-20-00269)			20
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10-20-00272	OPTI-LOK 6K Hex Head Short Nuts & Ferrules, 10/Pk (10-20-00271 & 10-20-00269)			20
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10-20-00288	OPTI-LOK 6K 10-32 Tee, .050" Thru, PEEK			21
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10-20-00320	OPTI-LOK 6K 10-32 Cross, .050" Thru, PEEK			21
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10-20-00331	OPTI-LOK 6K 1/4-28 SSI Style Male Nut & PEEK Ferrules, 10/Pk (10-20-00330 & 10-20-00269)			24, 89
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10-21-00286	OPTI-LOK LP 1/4-28 Tee, .062" Thru, PEEK			23
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10-21-00290	OPTI-LOK LP Nut for 1/16" OD Tubing, Natural PEEK			22
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10-21-00292	OPTI-LOK LP Nut for 1/16" OD Tubing, Natural Tefzel			22
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10-21-00294	OPTI-LOK LP Nut for 1/16" OD Tubing, with Counterbore, White Acetal			22
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10-21-00296	OPTI-LOK LP Ferrule for 1/16" OD Tubing, Natural PEEK			22
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10-21-00299	OPTI-LOK LP Nut for 1/16" OD Tubing, Teflon (PTFE)			22
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10-21-00302	OPTI-LOK LP Ferrule for 1/16" OD Tubing, Black PEEK			22
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10-21-00308	OPTI-LOK LP Long Nut for 1/8" OD Tubing, Natural PEEK			23
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10-21-00310	OPTI-LOK LP Nut for 1/8" OD Tubing, White Acetal			23
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10-21-00336	OPTI-LOK LP 1/4-28 Union, .040" Thru, PEEK			23
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10-21-00342	OPTI-LOK LP 1/4-28 Union, .020" Thru, PEEK			23
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10-21-00344	OPTI-LOK LP 1/4-28 Union, .030" Thru, PEEK			23
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10-22-00301	OPTI-LOK LP Ferrule for 1/16" OD Tubing, Short (Metric), Natural Tefzel			24
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10-22-00314	OPTI-LOK LP Nut for 1/8" OD Tubing, M6 (Metric), White Acetal			24
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10-22-00319	OPTI-LOK LP Ferrule for 1/8" OD Tubing, Short (Metric), Natural Tefzel			24
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10-22-00325	OPTI-LOK LP Union M6 (Metric), Natural Nylon			24
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10-22-00329	OPTI-LOK 6K PEEK M6 (Metric) Male Nut with Knurled/Hex Head & Ferrules, 10/Pk (10-22-00328 & 10-20-00269)			24
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10-23-00346	OPTI-LOK Adapter, Adapts 1/4-28 Male to M6 Male, (with Web), PEEK			19
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10-23-00349	OPTI-LOK Adapter, Adapts 1/4-28 Male to Luer Male, PEEK			18
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10-23-00351	OPTI-LOK Adapter, Adapts 1/4-28 Female to M6 Male, PEEK			18
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10-23-00353	OPTI-LOK Adapter, Adapts 1/4-28 Female to Luer Male, PEEK			18
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10-23-00355	OPTI-LOK Adapter, Adapts M6 Male to 10-32 Parker Style Male, PEEK			19
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10-23-00363	OPTI-LOK Adapter, Adapts M6 Male to Luer Male, PEEK			19
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10-23-00365	OPTI-LOK Adapter, Adapts 10-32 Parker Style Male to 1/4-28 Male Cone (SSI Style), SS			19
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10-23-00389	OPTI-LOK Adjustable Adapter, Adapts M6 Male to 10-32 Female, 2/Pk			17
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10-24-00368	Optimize Universal Male Nut for 1/16" OD Tubing, M6 (Metric), 316 SS			24
[illegible]	[illegible]			[illegible]
10-24-00370	Optimize Universal Ferrule for 1/16" OD Tubing, PEEK			24
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10-24-00373	Optimize Universal Union for 1/16" OD Tubing, with Nuts & Ferrules, 10-32 Thread, .020" Thru , SS			21
[illegible]	[illegible]			[illegible]
10-24-00376	Optimize Universal SS 10-32 Nuts & SS Ferrules, 10/Pk (10-24-00367 & 10-24-00369)			21
[illegible]	[illegible]			[illegible]
[illegible]	[illegible]			[illegible]
10-40-01677	OPTI-FLOW Package, Includes Digital Liquid Flowmeter, with 110 Volt Adapter and Software for Windows and DOS			29
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10-40-01905	OPTI-FLOW Package, Includes Digital Liquid Flowmeter, CE Marked Version with 220 Volt Adapter and Software for Windows and DOS			29
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10-45-01717	Chromatographic EPROM			34
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[illegible]	[illegible]			[illegible]
10-47-02004	OPTI-MAX Microbore 1/16" Diameter Ruby Ball/Sapphire Seat, SS Replacement Cartridge, for Low Flow Rate, Small Plunger Pumps, Fits xx-5x-xxxxx and xx-4x-xxxxx Series Housings, (2/Pk)			40
[illegible]	[illegible]			[illegible]
10-49-02004	OPTI-MAX Microbore 1/16" Diameter Ruby Ball/Sapphire Seat, PEEK Replacement Cartridge, for Low Flow Rate, Small Plunger Pumps, Fits xx-5x-xxxxx and xx-4x-xxxxx Series Housings, (2/Pk)			40
[illegible]	[illegible]			[illegible]
10-57-02004	OPTI-MAX Standard 1/8" Diameter Ruby Ball/Sapphire Seat, SS Replacement Cartridge, for Most Analytical Applications, Fits xx-5x-xxxxx and xx-4x-xxxxx Series Housings, (2/Pk)			40
[illegible]	[illegible]			[illegible]
10-59-02004	OPTI-MAX Standard 1/8" Diameter Ruby Ball/Sapphire Seat, PEEK Replacement Cartridge, for Most Analytical Applications, Fits xx-5x-xxxxx and xx-4x-xxxxx Series Housings, (2/Pk)			40
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10-67-02005	OPTI-MAX Extended Flow 3/16" Diameter Ruby Ball/Sapphire Seat, SS Replacement Cartridge, for Higher Flow Rate, Larger Plunger Pumps, Fits xx-6x-xxxxx Series Housings, (2/Pk)			40
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10-69-02005	OPTI-MAX Extended Flow 3/16" Diameter Ruby Ball/Sapphire Seat PEEK Replacement Cartridge, for Higher Flow Rate, Larger Plunger Pumps, Fits xx-6x-xxxxx Series Housings, (2/Pk)			40
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[illegible]	[illegible]			[illegible]
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21-34-00434	Piston, Spectraflow 400	1400-1970		51
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21-36-00439	OPTI-SEAL UHMW-PE Piston Seal, Spectraflow 400, 10/Pk	7200-0087		51
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21-38-00447	Tested Outlet Check Valve, 1/8", Spectraflow 400	7200-0062		51
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21-47-00460	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, SS Cartridge, Spectraflow 400			50
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21-48-00460	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ceramic Ball & Seat, PEEK Cartridge, Spectraflow 400			50
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21-49-00460	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, PEEK Cartridge, Spectraflow 400			50
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21-56-00460	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, SS Cartridge, Spectraflow 400	7200-0062		50
[illegible]	[illegible]	[illegible]		[illegible]
21-57-00460	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, SS Cartridge, Spectraflow 400	7200-0062		50
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21-58-00460	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, Spectraflow 400	7200-0062		50
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21-59-00460	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, PEEK Cartridge, Spectraflow 400	7200-0062		50
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22-08-01332	HPLC First Aid Kit, 100A			54
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22-36-00497	ITB PTFE Piston Seal, 114/114M, 116, 126, 10/Pk			54
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22-36-00499	OPTI-SEAL UHMW-PE Piston Seal, 100A, 110A/110B, 10/Pk			54
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22-67-00520	OPTI-MAX Outlet Cartridge Check Valve, 3/16" Ruby Ball/Sapphire Seat, SS Cartridge, All Beckman	240721		52
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22-68-00520	OPTI-MAX Outlet Cartridge Check Valve, 3/16" Ceramic Ball & Seat, PEEK Cartridge, All Beckman	240721		52
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22-69-00520	OPTI-MAX Outlet Cartridge Check Valve, 3/16" Ruby Ball/Sapphire Seat, PEEK Cartridge, All Beckman	240721		52
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23-36-00532	ITB PTFE Piston Seal, 1330, 1350, 1350T, 2700, 10/Pk			57
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23-36-00535	OPTI-SEAL UHMW-PE Piston Seal, 1330, 1350, 1350T, 2700, 10/Pk			57
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23-58-00551	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, 1330, 1350	125-0307		56
[illegible]	[illegible]	[illegible]		[illegible]
23-59-00551	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, PEEK Cartridge, 1330, 1350	125-0307		56
BISCHOFF				
[illegible]	[illegible]			[illegible]
24-08-00557	HPLC First Aid Kit, (Analytical) Bischoff 2200, Anspec SM909, Alcott Micromeritics 760			59
[illegible]	[illegible]			[illegible]
24-34-00559	Piston, (Analytical) Bischoff 2200, Anspec SM909, Alcott Micromeritics 760	2200-0210		59
[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]	[illegible]		[illegible]
24-36-00571	OPTI-SEAL UHMW-PE Piston Seal (Microbore Type) Bischoff 2200, Anspec SM909, Alcott Micromeritics 760	2200-0112		59
[illegible]	[illegible]			[illegible]
24-36-00573	ITB PTFE Piston Seal, (Microbore Type) Bischoff 2200, Anspec SM909, Alcott Micromeritics 760	2200-0112		59
[illegible]	[illegible]	[illegible]		[illegible]
24-36-00575	ITB PTFE Piston Seal, (Microbore Type) Bischoff 2200, Anspec SM909, Alcott Micromeritics 760, 10/Pk			59
[illegible]	[illegible]	[illegible]		[illegible]
24-36-01298	OPTI-SEAL UHMW-PE Piston Seal, (Analytical) Bischoff 2200, Anspec SM909, Alcott Micromeritics 760, 10/Pk			59
[illegible]	[illegible]	[illegible]		[illegible]
24-36-01304	ITB PTFE Piston Seal, (Analytical) Bischoff 2200, Anspec SM909, Alcott Micromeritics 760, 10/Pk			59
[illegible]	[illegible]	[illegible]		[illegible]
24-46-00589	OPTI-MAX Outlet Cartridge Check Valve, 1/16 Ceramic Ball & Seat, SS Cartridge, (Microbore Type) 2200, Anspec SM909, Alcott Micromeritics 760	2200-0130		58
[illegible]	[illegible]	[illegible]		[illegible]
24-47-00589	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, SS Cartridge, (Microbore Type) 2200, Anspec SM909, Alcott Micromeritics 760	2200-0130		58
[illegible]	[illegible]	[illegible]		[illegible]
24-48-00589	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ceramic Ball & Seat, PEEK Cartridge, (Microbore Type) 2200, Anspec SM909, Alcott Micromeritics 760	2200-0130		58
[illegible]	[illegible]	[illegible]		[illegible]
24-49-00589	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, PEEK Cartridge, (Microbore Type) 2200, Anspec SM909, Alcott Micromeritics 760	2200-0130		58
[illegible]	[illegible]	[illegible]		[illegible]
24-56-00581	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, SS Cartridge, (Analytical) Bischoff 2200, Anspec SM909, Alcott Micromeritics 760	2200-0230		58

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24-57-00581	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, SS Cartridge, (Analytical) Bischoff 2200,Anspec SM909,Alcott Micromeritics 760	2200-0230		58
[illegible]	[illegible]	[illegible]		[illegible]
24-58-00581	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, (Analytical) Bischoff 2200,Anspec SM909,Alcott Micromeritics 760	2200-0230		58
[illegible]	[illegible]	[illegible]		[illegible]
24-59-00581	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, PEEK Cartridge, (Analytical) Bischoff 2200,Anspec SM909,Alcott Micromeritics 760	2200-0230		58
DIONEX				
[illegible]	[illegible]			[illegible]
25-08-00594	HPLC First Aid Kit, DQP, GPM-1, DRP			61
[illegible]	[illegible]			[illegible]
25-34-00596	Improved Ruby Piston, DQP, GPM-1, DRP, GPM-2, DXP, AGP (Analytical), 2000, 4000	36904		61
[illegible]	[illegible]	[illegible]		[illegible]
25-36-00598	OPTI-SEAL UHMW-PE Piston Seal (Hastelloy C Spring), All Analytical , 10/Pk			61
[illegible]	[illegible]	[illegible]		[illegible]
25-36-00600	UHMW-PE Piston Seal (Elastomer O-Ring) All Analytical, 10/Pk			61
[illegible]	[illegible]	[illegible]		[illegible]
25-36-00602	Back-Up Seal, All Analytical, 10/Pk			61
[illegible]	[illegible]	[illegible]		[illegible]
25-38-00607	Tested Outlet Check Valve (Old Style), DQP, GPM-1, DRP	38272		61
[illegible]	[illegible]			[illegible]
25-38-00610	Tested Outlet Check Valve (New Style), GPM-2, DXP, AGP (Analytical), 2000, 4000	42761		61
[illegible]	[illegible]	[illegible]		[illegible]
25-58-00613	OPTI-MAX Inlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge DQP, GPM-1, DRP, GPM-2, DXP, AGP (Analytical), 2000, 4000	38273		60
[illegible]	[illegible]	[illegible]		[illegible]
25-59-00612	OPTI-MAX Outlet Check Valve (New Style), 1/8" Ruby Ball/Sapphire Seat, PEEK Cartridge, GPM-2, DXP, AGP (Analytical), 2000, 4000	42761		60
[illegible]	[illegible]	[illegible]		[illegible]
25-59-00616	OPTI-MAX Outlet Cartridge Check Valve (Old Style), 1/8" Ruby Ball/Sapphire Seat, PEEK Cartridge, DQP, GPM-1, DRP	38272		60
GILSON/RAININ	NOTE: Gilson OEM part numbers listed here — for Rainin OEM part numbers, please see pages 62-63.			
[illegible]	[illegible]			[illegible]
26-08-00622	HPLC First Aid Kit, 10 mL SC Type Head			63
[illegible]	[illegible]	[illegible]		[illegible]
26-34-00624	Piston, 10 mL S/SC Head [Gilson, Rainin HP, HPX, HPXL, SD200/300]	3650009		63
[illegible]	[illegible]	[illegible]		[illegible]
26-36-00630	ITB PTFE Piston Seal, 10 mL S/SC Head [Gilson, Rainin HP, HPX, HPXL, SD200/300]	5463125095		63
[illegible]	[illegible]	[illegible]		[illegible]
26-36-00632	OPTI-SEAL UHMW-PE Piston Seal, 10 mL S/SC Head [Gilson, Rainin HP, HPX, HPXL, SD200/300]	5463125895		63
[illegible]	[illegible]	[illegible]		[illegible]
26-36-00634	OPTI-SEAL UHMW-PE Piston Seal, 5 mL S/SC Head [Gilson, Rainin HP, HPX, HPXL, SD200/300]	5463088863		63
[illegible]	[illegible]	[illegible]		[illegible]
26-36-00636	ITB PTFE Piston Seal, 5 mL S/SC Head [Gilson, Rainin HP, HPX, HPXL, SD200/300]	5463088063		63
[illegible]	[illegible]			[illegible]
[illegible]	[illegible]			[illegible]
26-46-00647	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ceramic Ball & Seat, 5, 10 & 25 mL S/SC Heads[Gilson, Rainin HP, HPX, HPXL, SD200/300]			62
[illegible]	[illegible]			[illegible]
26-47-00647	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, SS Cartridge, 5, 10 & 25 mL S/SC Heads[Gilson, Rainin HP, HPX, HPXL, SD200/300]			62
[illegible]	[illegible]			[illegible]
26-48-00647	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ceramic Ball & Seat, 5, 10 & 25 mL S/SC Heads[Gilson, Rainin HP, HPX, HPXL, SD200/300]			62
[illegible]	[illegible]			[illegible]
26-49-00647	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, SS Cartridge, 5, 10 & 25 mL S/SC Heads[Gilson, Rainin HP, HPX, HPXL, SD200/300]			62
[illegible]	[illegible]	[illegible]		[illegible]
26-56-00647	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, 5, 10 & 25 mL S/SC Heads[Gilson, Rainin HP, HPX, HPXL, SD200/300]	3645245		62
[illegible]	[illegible]	[illegible]		[illegible]
26-57-00647	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, SS Cartridge, 5, 10 & 25 mL S/SC Heads[Gilson, Rainin HP, HPX, HPXL, SD200/300]	3645245		62

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GILSON/RAININ (continued)	**NOTE: Gilson OEM Part numbers listed here — for Rainin OEM Part numbers, please see pages 62-63.**			
26-58-00647	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, 5, 10 & 25 mL S/SC Heads[Gilson, Rainin HP, HPX, HPXL, SD200/300]	3645245		62
26-59-00647	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, SS Cartridge, 5, 10 & 25 mL S/SC Heads[Gilson, Rainin HP, HPX, HPXL, SD200/300]	3645245		62
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27-08-00657	HPLC First Aid Kit, HP-1090			68
27-34-00658	Sapphire Plunger, HP-1050, HP-1100	5062-2441		68
27-36-00663	OPTI-SEAL UHMW-PE Plunger Seal, HP-1090	5062-2494		68
27-36-00665	ITB PTFE Plunger Seal, HP-1090	5062-2494		68
27-36-01570	OPTI-SEAL UHMW-PE Plunger Seal, HP-1050, HP-1100	5062-8516		68
27-36-01572	ITB PTFE Plunger Seal, HP-1050, HP-1100	5062-8516		68
27-38-00672	Cartridge Check Valve Replacements, HP-1090, 2/Pk	79835-67101		67
27-38-00682	Tested Outlet Cartridge Check Valve with Housing, HP-1090	79835-25211 & 79835-67101		67
27-57-01330	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, SS Cartridge, HP-1050, HP-1100	01018-60008		67
27-59-01330	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, PEEK Cartridge, HP-1050, HP-1100	01018-60008		67
HITACHI				
28-08-00684	HPLC First Aid Kit, 655, L-6000, L-6200, L-6200A			70
28-36-00689	ITB PTFE Piston Seal, 655, L-6000, L-6200, L-6200A, L-7100 (LaChrom), 10/Pk			70
28-36-00691	OPTI-SEAL UHMW-PE Piston Seal, with Hastelloy C Spring, 655, L-6000, L-6200, L-6200A, L-7100 (LaChrom)			70
28-36-00693	OPTI-SEAL UHMW-PE Piston Seal, with Hastelloy C Spring, 655, L-6000, L-6200, L-6200A, L-7100 (LaChrom), 10/Pk			70
28-38-00699	Tested Outlet Check Valve, 655, L-6000, L-6200, L-6200A	885-1331		70
28-46-00712	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ceramic Ball & Seat, SS Cartridge, 655, L-6000, L-6200, L-6200A	885-1331		69
28-47-00712	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, SS Cartridge, 655, L-6000, L-6200, L-6200A	885-1331		69
28-48-00712	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ceramic Ball & Seat, PEEK Cartridge, 655, L-6000, L-6200, L-6200A	885-1331		69
28-49-00712	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, PEEK Cartridge, 655, L-6000, L-6200, L-6200A	885-1331		69
28-56-00712	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, SS Cartridge, 655, L-6000, L-6200, L-6200A			69
28-57-00712	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, SS Cartridge, 655, L-6000, L-6200, L-6200A			69
28-58-00712	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, 655, L-6000, L-6200, L-6200A			69
28-59-00712	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, PEEK Cartridge, 655, L-6000, L-6200, L-6200A			69

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28-46-02094	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ceramic Ball & Seat, SS Cartridge, L-7100 (LaChrom)	810-1005		69
[illegible]	[illegible]	[illegible]		[illegible]
28-47-02094	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, SS Cartridge, L-7100 (LaChrom)	810-1005		69
[illegible]	[illegible]	[illegible]		[illegible]
28-48-02094	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ceramic Ball & Seat, PEEK Cartridge, L-7100 (LaChrom)	810-1005		69
[illegible]	[illegible]	[illegible]		[illegible]
28-49-02094	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, PEEK Cartridge, L-7100 (LaChrom)	810-1005		69
ISCO				
[illegible]	[illegible]	[illegible]		[illegible]
29-36-00724	ITB PTFE Piston Seal, Primary, 2300, 2350, 10/Pk			71
[illegible]	[illegible]	[illegible]		[illegible]
29-36-01298	OPTI-SEAL UHMW-PE Piston Seal, Secondary, 2300, 2350 10/Pk			71
[illegible]	[illegible]	[illegible]		[illegible]
29-36-01304	ITB PTFE Piston Seal, Secondary, 2300, 2350, 10/Pk			71
[illegible]	[illegible]	[illegible]		[illegible]
29-36-01306	OPTI-SEAL UHMW-PE Piston Seal, Primary, 2300, 2350 , 10/Pk			71
[illegible]	[illegible]	[illegible]		[illegible]
29-66-01344	OPTI-MAX EF Outlet Cartridge Check Valve 3/16" Ceramic Ball & Seat, SS Cartridge, 2300, 2350	60-2253-209		71
[illegible]	[illegible]	[illegible]		[illegible]
29-67-01344	OPTI-MAX EF Outlet Cartridge Check Valve 3/16" Ruby Ball/Sapphire Seat, SS Cartridge, 2300, 2350	60-2253-209		71
[illegible]	[illegible]	[illegible]		[illegible]
29-68-01344	OPTI-MAX EF Outlet Cartridge Check Valve 3/16" Ceramic Ball & Seat, PEEK Cartridge, 2300, 2350	60-2253-209		71
[illegible]	[illegible]	[illegible]		[illegible]
29-69-01344	OPTI-MAX EF Outlet Cartridge Check Valve 3/16" Ruby Ball/Sapphire Seat, PEEK Cartridge, 2300, 2350	60-2253-209		71
KNAUER				
[illegible]	[illegible]	[illegible]		[illegible]
30-36-00732	OPTI-SEAL UHMW-PE Piston Seal, Knauer M640, 10/Pk			102
LDC/MILTON ROY				
[illegible]	[illegible]			75
31-08-00734	HPLC First Aid Kit, All Analytical			
[illegible]	[illegible]	1960066975		75
31-24-00736	1/16" Nut & Ferrule, for Discharge Tube			
[illegible]	[illegible]	801306		75
31-34-00738	Sapphire Plunger, All Analytical			
[illegible]	[illegible]	204040		75
31-34-00740	Plunger Crosshead Spring, Minimetric			
[illegible]	[illegible]			75
31-36-00746	UHMW-PE Plunger Seal, Gold, All Analytical, 10/Pk			
[illegible]	[illegible]	801598		75
31-36-00750	Plunger Seal Replacement Kit, ITB			
[illegible]	[illegible]	206234		75
31-36-00806	OPTI-SEAL UHMW-PE Plunger Seal, All Analytical			
[illegible]	[illegible]	206129001		75
31-36-00808	ITB PTFE Plunger Seal, All Analytical			
[illegible]	[illegible]	900947001		75
31-38-00755	Tested Suction Check Valve, All Analytical			
[illegible]	[illegible]	900517		75
31-38-00757	Check Valve Rebuild Kit (All Internal Parts, Rebuilds 1)			
[illegible]	[illegible]	[illegible]		[illegible]
31-56-00764	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, SS Cartridge, All Analytical	900947002		74
[illegible]	[illegible]	[illegible]		[illegible]
31-57-00764	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, SS Cartridge, All Analytical	900947002		74
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31-58-00764	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, All Analytical	900947002		74
[illegible]	[illegible]	[illegible]		[illegible]
31-59-00764	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, PEEK Cartridge, All Analytical	900947002		74

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32-08-00770	HPLC First Aid Kit, 2150			77
[illegible]	[illegible]	[illegible]		[illegible]
32-36-01297	OPTI-SEAL UHMW-PE Piston Seal with Back-Up Ring, 2150, 2248	80-1037-39		77
[illegible]	[illegible]			[illegible]
32-36-01303	ITB PTFE Piston Seal with Back-Up Ring, 2150, 2248	80-1037-39		77
[illegible]	[illegible]			[illegible]
32-38-00774	Tested Inlet Check Valve, 2150, 2248	80-1035-19		77
[illegible]	[illegible]	[illegible]		[illegible]
32-38-00781	Check Valve Rebuild Kit, 2150, 2248, Rebuilds 2			77
[illegible]	[illegible]	[illegible]		[illegible]
32-46-00787	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ceramic Ball & Seat, SS Cartridge, 2150, 2248	80-1035-20		76
[illegible]	[illegible]	[illegible]		[illegible]
32-47-00787	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, SS Cartridge, 2150, 2248	80-1035-20		76
[illegible]	[illegible]	[illegible]		[illegible]
32-48-00787	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ceramic Ball & Seat, PEEK Cartridge, 2150, 2248	80-1035-20		76
[illegible]	[illegible]	[illegible]		[illegible]
32-49-00787	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, PEEK Cartridge, 2150, 2248	80-1035-20		76
[illegible]	[illegible]			[illegible]
32-56-00787	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, SS Cartridge, 2150, 2248			76
[illegible]	[illegible]			[illegible]
32-57-00787	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, SS Cartridge, 2150, 2248			76
[illegible]	[illegible]			[illegible]
32-58-00787	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, 2150, 2248			76
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32-59-00787	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, PEEK Cartridge, 2150, 2248			76
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[illegible]	[illegible]			[illegible]
33-08-00793	HPLC First Aid Kit, Model 250, Series 200,410, 620, Integral 4000 (Manufactured After 12/89)			79
[illegible]	[illegible]			[illegible]
33-08-00795	HPLC First Aid Kit, Series 10			79
[illegible]	[illegible]			[illegible]
33-32-01638	Calcium Cathode Lamp 3100 AA Spectrophotometer			79
[illegible]	[illegible]	[illegible]		[illegible]
33-34-00798	Piston (High Pressure), Model 250, Series 200, 410, 620, Integral 4000 (Manufactured After 12/89)	N260-0124		79
[illegible]	[illegible]	[illegible]		[illegible]
33-34-00800	Piston (Low Pressure), Series 4, 400, 410, 620 (Manufactured Before 12/89)	0254-2149		79
[illegible]	[illegible]	[illegible]		[illegible]
33-34-01296	Piston (High Pressure), Series 10	0254-2442		79
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33-36-00803	ITB PTFE Piston Seal (Low Pressure), Series 4, 400, 410, 620, Integral 4000, 10/Pk			79
[illegible]	[illegible]	[illegible]		[illegible]
33-36-00805	OPTI-SEAL UHMW-PE Piston Seal (Low Pressure), Series 4, 400, 410, 620, Integral 4000, 10/Pk			79
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33-36-00807	OPTI-SEAL UHMW-PE Piston Seal, Series 100, 10/Pk			79
[illegible]	[illegible]	[illegible]		[illegible]
33-36-00809	Piston Seal, Series 100, 10/Pk			79
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33-36-01300	ITB PTFE Piston Seal (High Pressure), Model 250, Series 4, 200, 400, 410, 620, Integral 4000, Series 1, 2, 3, 3B, 10, 10/Pk			79
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33-36-01302	OPTI-SEAL UHMW-PE Piston Seal (High Pressure), Model 250, Series 4, 200, 400, 410, 620, Integral 4000, Series 1, 2, 3, 3B, 10, 10/Pk			79
[illegible]	[illegible]			[illegible]
33-38-00828	Check Valve Rebuild Kit, Series 1, 2, 3, 3B, 10, Rebuilds 2			78
[illegible]	[illegible]	[illegible]		[illegible]
33-56-00835	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, SS Cartridge, Model 250, Series 4, 200, 400, 410, 620, Integral 4000	0254-0197		78

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33-56-00845	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, SS Cartridge, Series 1, 2, 3, 3B, 10	0254-0547		78
[illegible]	[illegible]	[illegible]		[illegible]
33-57-00835	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, SS Cartridge, Model 250, Series 4, 200, 400, 410, 620, Integral 4000	0254-0197		78
[illegible]	[illegible]	[illegible]		[illegible]
33-57-00845	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, SS Cartridge, Series 1, 2, 3, 3B, 10	0254-0547		78
[illegible]	[illegible]	[illegible]		[illegible]
33-58-00835	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, Model 250, Series 4, 200, 400, 410, 620, Integral 4000	0254-0197		78
[illegible]	[illegible]	[illegible]		[illegible]
33-58-00845	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, Series 1, 2, 3, 3B, 10	0254-0547		78
[illegible]	[illegible]	[illegible]		[illegible]
33-59-00835	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, PEEK Cartridge, Model 250, Series 4, 200, 400, 410, 620, Integral 4000	0254-0197		78
[illegible]	[illegible]	[illegible]		[illegible]
33-59-00845	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, PEEK Cartridge, Series 1, 2, 3, 3B, 10	0254-0547		78
SHIMADZU				
[illegible]	[illegible]			[illegible]
34-08-00851	HPLC First Aid Kit, LC-6A			83
[illegible]	[illegible]			[illegible]
34-08-00887	HPLC First Aid Kit, LC-10AS			83
[illegible]	[illegible]			[illegible]
34-24-01327	Shimadzu Type SS Nut for 1/8" OD Tubing			
[illegible]	[illegible]	[illegible]		[illegible]
34-34-00854	Sapphire Plunger, LC-6A	228-12904-93		83
[illegible]	[illegible]	[illegible]		[illegible]
34-34-01994	Plunger Housing, LC-10AT (Housing Only - Requires 10-AS Plunger Insert)			83
[illegible]	[illegible]	[illegible]		[illegible]
34-36-00855	OPTI-SEAL UHMW-PE Plunger Seal, LC-600/LC-9A, LC-10AD, ESA Model 580	228-18745-00		83
[illegible]	[illegible]			[illegible]
34-36-00857	UHMW-PE/Elastomer Energized Plunger Seal, LC-600/LC-9A, LC-10AD	228-18745-00		83
[illegible]	[illegible]			[illegible]
34-36-00863	ITB PTFE Plunger Seal, LC-6A	228-11999-00		83
[illegible]	[illegible]			[illegible]
34-36-00865	OPTI-SEAL UHMW-PE Plunger Seal, LC-6A	228-11999-00		83
[illegible]	[illegible]	[illegible]		[illegible]
34-36-00865	OPTI-SEAL UHMW-PE Plunger Seal, LC-10AS, LC-10AT Back-Up Seal	228-28499-00		83
[illegible]	[illegible]			[illegible]
34-36-00866	OPTI-SEAL UHMW-PE Plunger Seal, LC-10AS, LC-10AT, 10/Pk			83
[illegible]	[illegible]			[illegible]
[illegible]	[illegible]	[illegible]		[illegible]
34-38-00874	Tested Outlet Check Valve, LC-600/LC-9A, LC-10AD	228-18522-92		82
[illegible]	[illegible]	[illegible]		[illegible]
34-38-00877	Tested Inlet Check Valve, LC-6A, LC-10AS	228-12353-91		82
[illegible]	[illegible]	[illegible]		[illegible]
34-38-00884	Check Valve Rebuild Kit, LC-6A, LC-10AS, Rebuilds 2	228-11200-91		82
[illegible]	[illegible]	[illegible]		[illegible]
34-46-00893	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ceramic Ball & Seat, SS Cartridge, LC-600/LC-9A, LC-10AD/AT	228-18522-92		81
[illegible]	[illegible]	[illegible]		[illegible]
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34-47-00893	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, SS Cartridge, LC-600/LC-9A, LC-10AD/AT	228-18522-92		81
[illegible]	[illegible]	[illegible]		[illegible]

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SHIMADZU (continued)				
[illegible]	[illegible]	[illegible]		[illegible]
34-48-00893	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ceramic Ball & Seat, PEEK Cartridge, LC-600/LC-9A, LC-10AD/AT	228-18522-92		81
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[illegible]	[illegible]	[illegible]		[illegible]
34-49-00893	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, PEEK Cartridge, LC-600/LC-9A, LC-10AD/AT	228-18522-92		81
[illegible]	[illegible]	[illegible]		[illegible]
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34-56-00893	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, SS Cartridge, LC-600/LC-9A, LC-10AD/AT, ESA Model 580			81
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34-56-00907	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, SS Cartridge, LC-6A, LC-10AS	228-09054-93		81
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34-57-00893	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, SS Cartridge, LC-600/LC-9A, LC-10AD/AT, ESA Model 580			81
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34-57-00907	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, SS Cartridge, LC-6A, LC-10AS	228-09054-93		81
[illegible]	[illegible]			[illegible]
34-58-00893	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, LC-600/LC-9A, LC-10AD/AT, ESA Model 580			81
[illegible]	[illegible]	[illegible]		[illegible]
34-58-00907	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, LC-6A, LC-10AS	228-09054-93		81
[illegible]	[illegible]			[illegible]
34-59-00893	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, PEEK Cartridge, LC-600/LC-9A, LC-10AD/AT, ESA Model 580			81
[illegible]	[illegible]	[illegible]		[illegible]
34-59-00907	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, PEEK Cartridge, LC-6A, LC-10AS	228-09054-93		81
SPECTRA-PHYSICS				
[illegible]	[illegible]			[illegible]
35-08-00913	HPLC Fittings Kit (Valco Injection Valve)			86
[illegible]	[illegible]			[illegible]
35-08-01334	HPLC First Aid Kit, P-Series			86
[illegible]	[illegible]	[illegible]		[illegible]
35-32-01333	SP Focus Detector Lamp, Normal	9551-0023		86
[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]	[illegible]		[illegible]
35-36-00917	Back-Up Seal, PEEK, 8000, 10/Pk			86
[illegible]	[illegible]	[illegible]		[illegible]
35-36-00919	OPTI-SEAL UHMW-PE Flush Seal, 8800, 8810, IsoChrom, P-Series, 10/Pk (Flush Seal)			85
[illegible]	[illegible]	[illegible]		[illegible]
35-36-00921	ITB PTFE Flush Seal, 8800, 8810, IsoChrom, P-Series, 10/Pk (Flush Seal)			85
[illegible]	[illegible]	[illegible]		[illegible]
35-36-00931	OPTI-SEAL UHMW-PE Piston Seal, 8800, 8810, IsoChrom, P-Series, 10/Pk			85
[illegible]	[illegible]	[illegible]		[illegible]
35-36-00933	OPTI-SEAL UHMW-PE Piston Seal, 8000, 10/Pk			86
[illegible]	[illegible]	[illegible]		[illegible]
35-36-00935	OPTI-SEAL UHMW-PE Piston Seal, 8700, 8700XR, 8750, 10/Pk			86
[illegible]	[illegible]	[illegible]		[illegible]
35-36-00937	ITB PTFE Piston Seal, 8700, 8700XR, 8750, 10/Pk			86
[illegible]	[illegible]	[illegible]		[illegible]
35-36-00939	ITB PTFE Piston Seal, 8800, 8810, IsoChrom, P-Series, 10/Pk			85
[illegible]	[illegible]	[illegible]		[illegible]
35-38-00941	Check Valve Tube Assembly (For Outlet)	A3479-010S		85
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35-38-00944	Tested Transducer Check Valve, P-Series	A3990-010		85
[illegible]	[illegible]	[illegible]		[illegible]
35-38-00949	Tested Outlet Check Valve, 8700, 8800, 8810, IsoChrom	A3490-010		85
[illegible]	[illegible]			[illegible]
[illegible]	[illegible]	[illegible]		[illegible]
35-56-00956	OPTI-MAX Inlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, SS Cartridge, 8700, 8800, 8810, IsoChrom, P-Series	A3495-010		84
[illegible]	[illegible]	[illegible]		[illegible]

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35-57-00956	OPTI-MAX Inlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, SS Cartridge, 8700, 8800, 8810, IsoChrom, P-Series	A3495-010		84
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[illegible]	[illegible]			
35-58-00956	OPTI-MAX Inlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, 8700, 8800, 8810, IsoChrom, P-Series	A3495-010		84
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[illegible]	[illegible]			
35-59-00956	OPTI-MAX Inlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, PEEK Cartridge, 8700, 8800, 8810, IsoChrom, P-Series	A3495-010		84
[illegible]	[illegible]			
SSI				
[illegible]	[illegible]			89
36-08-00967	HPLC First Aid Kit, 200 Series (without Self-Flushing Option)			
[illegible]	[illegible]			89
36-24-00969	SSI Style 1/4-28 Nut for 1/16" OD Tubing			
[illegible]	[illegible]			89
36-24-01674	SSI Style SS Ferrule for 1/16" OD Tubing			
[illegible]	[illegible]	12-0101		89
36-34-01296	Sapphire Piston, 200 Series (without Self-Flushing Option)			
[illegible]	[illegible]			89
36-36-01300	ITB PTFE Piston Seal, 200 Series & Model 300, 10/Pk			
[illegible]	[illegible]			89
36-36-01302	OPTI-SEAL UHMW-PE Piston Seal, 200 Series & Model 300, 10/Pk			
[illegible]	[illegible]			
36-56-00987	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, SS Cartridge, 200 Series & Model 300	02-0163		88
[illegible]	[illegible]			
36-57-00987	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, SS Cartridge, 200 Series & Model 300	02-0163		88
[illegible]	[illegible]			
36-58-00987	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, 200 Series & Model 300	02-0163		88
[illegible]	[illegible]			
36-59-00987	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, PEEK Cartridge, 200 Series & Model 300	02-0163		88
TRACOR				
[illegible]	[illegible]			102
37-36-00995	OPTI-SEAL UHMW-PE Piston Seal, 10/Pk			
VARIAN				
[illegible]	[illegible]			91
38-08-00913	HPLC Fittings Kit (Valco Sample Injection Valve)			
[illegible]	[illegible]			91
38-08-02047	HPLC First Aid Kit, 2510			
[illegible]	[illegible]			91
38-10-01083	Seal Forming Tool, 2010, 2510			
[illegible]	[illegible]	00-997261-08		91
38-34-00999	Sapphire Piston, 2010, 2510			
[illegible]	[illegible]	00-997261-37		91
38-36-01000	OPTI-SEAL UHMW-PE Piston Seal, 2010, 2510			
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38-36-01002	ITB PTFE Piston Seal, 2010, 2510			
[illegible]	[illegible]			91
38-36-01553	ITB PTFE Piston Seal, 9000 Star			
[illegible]	[illegible]			91
38-36-01555	OPTI-SEAL UHMW-PE Piston Seal, 9000 Star			
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[illegible]	[illegible]	00-997261-10		91
38-38-01021	Tested Outlet Check Valve, 2010			
[illegible]	[illegible]			

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OPTI-Part #	Description	OEM #	Price	Page #
VARIAN (continued)				
38-56-01043	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, SS Cartridge, 2010	00-997261-10		90
38-56-01544	OPTI-MAX Inlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, SS Cartridge, 2510	00-997554-19		90
38-57-01043	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, SS Cartridge, 2010	00-997261-10		90
38-57-01544	OPTI-MAX Inlet Cartridge Check Valve, 1/8" Ruby Ball & Sapphire Seat, SS Cartridge, 2510	00-997554-19		90
38-58-01043	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, 2010	00-997261-10		90
38-58-01544	OPTI-MAX Inlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, 2510	00-997554-19		90
38-59-01043	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, PEEK Cartridge, 2010	00-997261-10		90
38-59-01544	OPTI-MAX Inlet Cartridge Check Valve, 1/8" Ruby Ball & Sapphire Seat, PEEK Cartridge, 2510	00-997554-19		90
WATERS				
39-08-01073	HPLC First Aid Kit, 100 µL Head [M45/45G, M501] (Analytical)			101
39-08-01075	HPLC First Aid Kit, 225 µL Head (#3) [510, 590, 600/600E, 610, 650, 6K/6KA] (Flow Rates >10 mL/min)			101
39-10-01077	Plunger Insertion Tool	11042		97
39-10-01083	Seal Forming Tool	76765		97
39-10-01085	Slotted Nut Driver for 1/16" Compression Screws	76374		97
39-24-01090	Waters Type Compression Screw for 1/16" OD Tubing	05070		25, 97
39-24-01290	Waters Type PEEK Ferrule for 1/16" OD Tubing	21817		25, 97
39-30-01095	Liquid Seal, Black	05101		100
39-30-01099	Liquid Seal, White	05112		100
39-30-01102	LPV, PTFE Washer	05126		100
39-30-01104	Syringe Barrel Seal	77347		100
39-30-01111	Spacer, Lower Needle Wash	05134		100
39-30-01114	PTFE Washer	05135		100
39-30-01116	WISP Needle, 712 and 715	77233		100
39-30-01118	PTFE O-Ring, 712 HPV			100
39-30-01125	WISP Solvent Seal, Long			101
39-30-01129	WISP 712 Injector Rebuild Kit (Old Style)	34497		100
39-30-01132	WISP 715 Seal Pack Assembly Rebuild Kit			100

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[illegible]	[illegible]	[illegible]		[illegible]
39-31-01134	OPTI-PRIME Round Pump Head with Standard Check Valves	60058		99
[illegible]	[illegible]	[illegible]		[illegible]
39-31-01138	Fluid Upgrade Kit, Standard Check Valves, 6K/6KA	25242		99
[illegible]	[illegible]	[illegible]		[illegible]
39-31-01144	Ball Plug	05061		99
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39-31-01146	Priming Syringe	27629		99
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39-31-01149	Syringe Priming Adapter/Tube: Luer Adapter & 1/8" ID Tubing (Easier to use than original nut & ferrule method)			99
[illegible]	[illegible]	[illegible]		[illegible]
39-31-01152	Draw-Off Tube Assembly	60476		99
[illegible]	[illegible]	[illegible]		[illegible]
39-31-01157	OPTI-PRIME Priming Valve			98
[illegible]	[illegible]	[illegible]		[illegible]
39-31-01171	Optimize Safety Syringe			98
[illegible]	[illegible]	[illegible]		[illegible]
39-31-01293	Threaded Seal Insert, M45, M45G, M501, 510, 590, 600/600E, 610	05098		99
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39-32-01176	Zinc Lamp, 441 Detector	97723		101
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39-32-01178	Quartz Lamp, 150C	75631		101
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39-32-01180	Source Lamp, 401	48419		101
[illegible]	[illegible]	[illegible]		[illegible]
39-32-01187	Deuterium Lamp, 486 Detector	80678		101
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39-32-01295	Source Lamp, 480, 481	99499		101
[illegible]	[illegible]	[illegible]		[illegible]
39-34-01191	Plunger, M45/45G, M501	26524		96
[illegible]	[illegible]	[illegible]		[illegible]
39-34-01195	Plunger Indicator Rod & Spring Kit, 2/Pk	69583		96
[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]	[illegible]		[illegible]
39-36-01207	ITB PTFE Plunger Seal, Black, 100 µL Head [M45/45G, M501, 510, 515, 590, 600/600E, 610, 6K/6KA], 10/Pk			96
[illegible]	[illegible]	[illegible]		[illegible]
39-36-01210	ITB PTFE Plunger Seal, Red, 100 µL Head [M45/45G, M501, 510, 515, 590, 600/600E, 610, 6K/6KA], 10/Pk			96
[illegible]	[illegible]	[illegible]		[illegible]
39-36-01213	ITB PTFE Plunger Seal, Tan, 100 µL Head [M45/45G, M501, 510, 515, 590, 600/600E, 610, 6K/6KA], 10/Pk			96
[illegible]	[illegible]	[illegible]		[illegible]
39-36-01215	ITB PTFE Plunger Seal, 225 µL Head (#3) [510, 590, 600/600E, 610, 650, 6K/6KA], 10/Pk			96
[illegible]	[illegible]	[illegible]		[illegible]
39-36-01217	OPTI-SEAL UHMW-PE Plunger Seal, 225 µL Head (#3) [510, 590, 600/600E, 610, 650, 6K/6KA], 10/Pk			96
[illegible]	[illegible]	[illegible]		[illegible]
39-36-01306	OPTI-SEAL UHMW-PE Plunger Seal, 100 µL Head [M45/45G, M501, 510, 515, 590, 600/600E, 610, 6K/6KA], 10/Pk			96
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39-38-01221	Gasket Retainer	60435		95
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39-38-01224	Washer	05090		95
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39-38-01226	Inlet Check Valve Rebuild Kit, Rebuilds 2	60495		95
[illegible]	[illegible]	[illegible]		[illegible]
39-38-01228	Outlet Housing	25212		95
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39-38-01230	Spring	05082		95
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39-38-01233	Actuator Seat, PTFE	05083		95
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39-38-01236	Actuator Outlet Check Valve Rebuild Kit, Rebuilds 2	26016		95
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39-38-01239	Rulon Washer	05071		95
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39-38-01244	Tested Extended Flow Inlet Check Valve, 225 µL Head (#3) [510, 590, 600/600E, 610, 650, 6K/6KA]	60307		95
[illegible]	[illegible]	[illegible]		[illegible]

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WATERS (continued)				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-38-01247	Guide	32705		95
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-38-01249	Tested Extended Flow Outlet Check Valve, 400 µL (#4) & 900 µL (#6) Heads [Delta Prep 3000, 600/600E, 650]	33326		95
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39-38-01308	Ruby Ball & Seat	25306		95
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39-38-01323	Housing Seal	32706		95
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-46-01950	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ceramic Ball & Seat, SS Cartridge, 616	55845 & 24960		93
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-46-01980	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ceramic Ball & Seat, SS Cartridge, Backflush System			94
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-47-01950	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, SS Cartridge, 616	55845 & 24960		93
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-47-01980	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, SS Cartridge, Backflush System			94
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-48-01909	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, SS Cartridge, 625/626 Biocompatible	30543 & 24120		94
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-48-01950	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, SS Cartridge, 616	55845 & 24960		93
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-48-01980	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, SS Cartridge, Backflush System			94
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-49-01909	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, PEEK Cartridge, 625/626 Biocompatible	30543 & 24120		94
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-49-01950	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, PEEK Cartridge, 616	55845 & 24960		93
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-49-01980	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, PEEK Cartridge, Backflush System			94
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-56-01139	Fluid Upgrade Kit, Cartridge Check Valves Ceramic Ball & Seat, SS Cartridges	25242		99
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-56-01256	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, SS Cartridge, 100 µL Head [M45, M45G, M501, 510, 515, 590, 600/600E, 610, 6K/6KA] & 225 µL Head (#3) [510, 590, 600/600E, 610, 650, 6K/6KA]	25216		93
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-57-01139	Fluid Upgrade Kit, Cartridge Check Valves Ruby Ball/Sapphire Seat, SS Cartridges	25242		99
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-57-01256	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, SS Cartridge, 100 µL Head [M45, M45G, M501, 510, 515, 590, 600/600E, 610, 6K/6KA] & 225 µL Head (#3) [510, 590, 600/600E, 610, 650, 6K/6KA]	25216		93
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-58-01139	Fluid Upgrade Kit, Cartridge Check Valves Ceramic Ball & Seat, PEEK Cartridges	25242		99
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39-58-01256	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, 100 µL Head [M45, M45G, M501, 510, 515, 590, 600/600E, 610, 6K/6KA] & 225 µL Head (#3) [510, 590, 600/600E, 610, 650, 6K/6KA]	25216		93
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39-59-01139	Fluid Upgrade Kit, Cartridge Check Valves Ruby Ball/Sapphire Seat, PEEK Cartridges	25242		99

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OPTI-Part #	Description	OEM #	Price	Page #
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39-66-01267	OPTI-MAX EF Outlet Cartridge Check Valve 3/16" Ceramic Ball & Seat, SS Cartridge, 400 µL (#4) & 900 µL (#6) Heads [Delta Prep 3000, 600/600E, 650]	33326		93
39-67-01267	OPTI-MAX EF Outlet Cartridge Check Valve 3/16" Ruby Ball/Sapphire Seat, SS Cartridge 400 µL (#4) & 900 µL (#6) Heads [Delta Prep 3000, 600/600E, 650]	33326		93
39-68-01267	OPTI-MAX EF Outlet Cartridge Check Valve 3/16" Ceramic Ball & Seat, PEEK Cartridge, 400 µL (#4) & 900 µL (#6) Heads [Delta Prep 3000, 600/600E, 650]	33326		93
39-69-01267	OPTI-MAX EF Outlet Cartridge Check Valve 3/16" Ruby Ball/Sapphire Seat, PEEK Cartridge, 400 µL (#4) & 900 µL (#6) Heads [Delta Prep 3000, 600/600E, 650]	33326		93
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40-24-01273	Parker Style Union for 1/16" OD Tubing, with Nuts & Ferrules, .020" Thru			25
40-24-01276	Parker Style Nuts & Ferrules, 10/Pk (40-24-01275 & 40-24-01291)			25
40-24-01291	Parker Style Ferrule for 1/16" OD Tubing, SS			25
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41-24-01280	Valco Union for 1/16" OD Tubing, with Nuts & Ferrules, .029" Thru			25
41-24-01282	Valco PEEK Ferrule for 1/16" OD Tubing			25
JASCO				
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42-08-02047	HPLC First Aid Kit, 880/980 Series			73
42-34-01354	Sapphire Piston, BIP-1, 880/980 Series	2305-0005A & 6560-H107A		73
42-36-01356	ITB PTFE Piston Seal, BIP-1, 880/980 Series, 10/Pk			73
42-36-01358	OPTI-SEAL UHMW-PE Piston Seal, BIP-1, 880/980 Series, 10/Pk			73
42-38-01021	Tested Outlet Check Valve, BIP-1	6260-H102A		73
42-56-01043	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, SS Cartridge, BIP-1	6260-H102A		72
42-56-01546	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, SS Cartridge, 880/980 Series	6560-H404A		72
				72
42-57-01043	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/ Sapphire Seat, SS Cartridge, BIP-1	6260-H102A		72
42-57-01546	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball & Sapphire Seat, SS Cartridge, 880/980 Series	6560-H404A		72

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JASCO (continued)				
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42-58-01043	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, BIP-1	6260-H102A		72
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42-58-01546	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, 880/980 Series	6560-H404A		72
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42-59-01043	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/ Sapphire Seat, PEEK Cartridge, BIP-1	6260-H102A		72
[illegible]	[illegible]	[illegible]		[illegible]
42-59-01546	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball & Sapphire Seat, PEEK Cartridge, 880/980 Series	6560-H404A		72
GYNKOTEK				
[illegible]	[illegible]			[illegible]
44-08-00433	HPLC First Aid Kit, 300, M480			65
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44-36-00437	OPTI-SEAL UHMW-PE Piston Seal, 300, M480	2266-0304		65
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44-38-00442	Tested 1/8" Inlet Check Valve, 300, M480	5005-3200		65
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44-38-00449	Check Valve Rebuild Kit, 1/8" Ruby Ball/Sapphire Seat, Rebuilds 2			65
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44-46-00460	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ceramic Ball & Seat, SS Cartridge, 300 and M480 Series	5005-3100		64
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44-47-00460	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, SS Cartridge, 300 and M480 Series	5005-3100		64
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44-48-00460	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ceramic Ball & Seat, PEEK Cartridge, 300 and M480 Series	5005-3100		64
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44-49-00460	OPTI-MAX Outlet Cartridge Check Valve, 1/16" Ruby Ball/Sapphire Seat, PEEK Cartridge, 300 and M480 Series	5005-3100		64
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44-56-00460	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, SS Cartridge, 300 and M480 Series			64
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44-57-00460	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, SS Cartridge, 300 and M480 Series			64
[illegible]	[illegible]			[illegible]
44-58-00460	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ceramic Ball & Seat, PEEK Cartridge, 300 and M480 Series			64
[illegible]	[illegible]			[illegible]
44-59-00460	OPTI-MAX Outlet Cartridge Check Valve, 1/8" Ruby Ball/Sapphire Seat, PEEK Cartridge, 300 and M480 Series			64
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45-57-01898	OPTI-MAX Inlet Cartridge Check Valve, Ruby Ball/Sapphire Seat, SS Cartridge, 420/422 M-Head			102
[illegible]	[illegible]			[illegible]
45-58-01898	OPTI-MAX Inlet Cartridge Check Valve, Ceramic Ball & Seat, PEEK Cartridge, 420/422 M-Head			102
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45-59-01898	OPTI-MAX Inlet Cartridge Check Valve, Ruby Ball/Sapphire Seat, PEEK Cartridge, 420/422 M-Head			102
[illegible]	[illegible]			[illegible]

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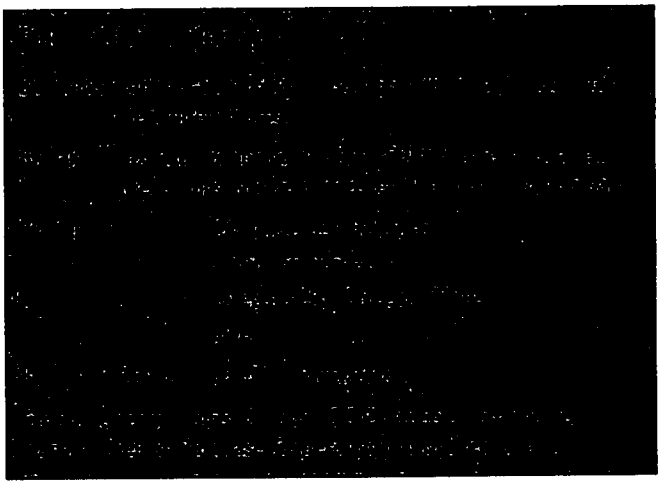

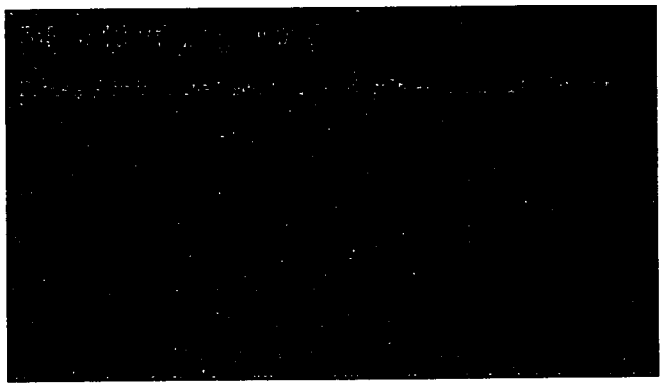

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