



Now available for GL-45 bottles!



Bottles not included

**Waste Overflow Indicator**

- Avoid messy pooling around mobile phase waste containers.
- Audible alarm instantly alerts user, preventing overflow.
- Compact, battery operated unit.
- Available for 4-liter and GL-45 solvent bottles.

The Restek Waste Overflow Indicator will help keep your mobile phase waste where it belongs—in the waste container! Compact, battery operated unit fits securely on solvent bottles and accommodates two waste streams. An audible alarm is given as the solvent waste container approaches capacity, giving you time to empty or change the container. Another innovative design from Restek!

Description	qty.	cat.#
Waste Overflow Indicator for HPLC Systems, 4 Liter	ea.	26543
Waste Overflow Indicator for HPLC Systems, GL-45	ea.	26550
Replacement AA Battery for the Waste Overflow Indicator	ea.	26544
Replacement AA Batteries for the Waste Overflow Indicator	3-pk.	26545

**Opti-Cap® Bottle Top**

The most economical way to helium-sparge and deliver HPLC mobile phases.

The Opti-Cap® top fits all standard GL-45 bottles and has two 1/8-inch holes and one 1/16-inch hole for tubing. All three openings are designed for threaded PEEK™ plugs



Bottle not included.

Description	qty.	cat.#
Opti-Cap (Cap and PEEK Plug)	ea.	25300
Opti-Cap Kit (Opti-Cap, 3 meters of tubing, sparging filters)	kit	25301
Opti-Cap Kit with 1L Bottle	kit	25302
Opti-Cap Kit with 2L Bottle	kit	25303
<b>Related items and replacement parts</b>	<b>qty.</b>	<b>cat.#</b>
Mobile Phase Sparge Filter: 2µm, stainless steel	ea.	25311
Mobile Phase Inlet Filter: 10µm	ea.	25312
Teflon Tubing, 1/8" OD x 0.094" (2.4mm) ID x 3m	3m	25307
Teflon Tubing, 1/8" OD x 0.063" (1.6mm) ID x 3m	3m	25306
PEEK Plug, 1/4"-28 threads	3-pk.	25319
1L Graduated Safety-Coated Bottle – GL-45 threads	ea.	25304
2L Graduated Safety-Coated Bottle – GL-45 threads	ea.	25305

**Eco-Cap Bottle Top, PTFE**

Fits all standard GL-45 bottles; has two 1/8-inch holes and one 1/16-inch hole for tubing. Holes are not threaded.



Description	qty.	cat.#
Eco-Cap Bottle Top, includes 1 Male Luer Plug	ea.	25395



**Opti-Cap® Adapters**

Allow the use of the Hub-Cap with GL-45 solvent bottles.

Description	qty.	cat.#
Opti-Cap Adapter	ea.	27197
Opti-Cap Adapter Multi-pack	3-pk.	27198
Opti-Cap Adapter w/Hub-Cap	kit	26551



### Hub-Cap 4 Liter Bottle Tops

Hub-Cap bottle tops are a great way to neatly keep your mobile phase lines where they belong. Use instead of parafilm, aluminum foil, or tape on your mobile phase reservoirs.



Description	qty.	cat.#
Hub-Cap (assembly of the bottle cap and plug)	kit	26541
Hub-Cap Multi-pack	3-pk.	26542



### Hub-Cap Adapters

Allow the use of the Opti-Cap™ with 4-liter solvent bottles.

Description	qty.	cat.#
Hub-Cap Adapter	ea.	26538
Hub-Cap Adapter Multi-pack	3-pk.	26539
Hub-Cap Adapter and Opti-Cap	kit	26540



### Mobile Phase Additives

Mobile phase additives such as triethylamine, trifluoroacetic acid, and ion-pairing reagents can compete with sample ions, decreasing sensitivity and, in some cases, reducing sample ion intake into the MS. To obtain symmetric peaks and/or sufficient retention, use base deactivated, state-of-the-art Type B silica packings that minimize the need for additives.

### Transfer and filter mobile phase in a single step!



### Hub-Cap Filter Kit

Kit includes: bottle adapter, bottle adapter nut, filter inlet cap, grid support, vacuum hose barb, tube compression fitting, 47 mm grid, 47 mm 0.22 μm filter membrane, 47 mm 0.45 μm filter membrane, 1/4" OD x 1/8" ID ultra chemical resistant, Teflon® FEP lined Tygon® tubing (3'), 6" x 6" box with shrink wrap insert. Includes universal threads designed for 4L or Wheaton bottles.



### Assembles quickly and easily!



Description	qty.	cat.#
Hub-Cap Filter Kit for 4L or Wheaton bottles	kit	26395
<b>Replacement Membrane Filters</b>	<b>qty.</b>	<b>cat.#</b>
Polypropylene Membrane Filters, 47mm, 0.45μm	100-pk.	26396
Polypropylene Membrane Filters, 47mm, 0.22μm	100-pk.	26397
Nylon Membrane Filters, 47mm, 0.45μm	100-pk.	26398
Nylon Membrane Filters, 47mm, 0.22μm	100-pk.	26399

**FlatLine Pulse Damper**

- Rupture-proof, no diaphragm—minimal risk of failure or leaks.
- Clean flush-out design—no sample carryover.
- Low internal volume—negligible effect on analyte bandwidth.



25340

The ASI FlatLine Pulse Damper combines performance and reliability in a simple, easy-to-use housing. Standard 10-32 inlet and outlet ports allow quick connection into virtually any HPLC system. Solid core technology provides reliable long-term operation without the downtime associated with ruptured or leaking membrane dampers. 600–700  $\mu\text{L}$  internal volume at ambient pressure. Maximum pressure: 6,000 psi (41,369 kPa)

Description	qty.	cat.#
FlatLine Pulse Damper, 1.5" W x 3.75" L	ea.	25340

**MiniPulse Pulse Damper**

- Compact unit (2.5" x 1.5") can be placed almost anywhere.
- Small, 160  $\mu\text{L}$  dead volume at atmospheric pressure.
- PEEK™ unit can withstand pressures to 5,000 psi (34,474 kPa).
- 316 Stainless steel unit can withstand pressures to 6,000 psi (41,369 kPa).



25238

Improves system baseline stability while increasing the total system volume by only 160  $\mu\text{L}$ . The MiniPulse pulse damper is ideal for applications where minimizing the total system volume is critical. Stainless steel and PEEK™ options for a wide range of applications.

Description	qty.	cat.#
MiniPulse Pulse Damper, Stainless Steel	ea.	25238
MiniPulse Pulse Damper, PEEK	ea.	25239



25013

**LO-Pulse Pulse Damper**

The LO-Pulse Pulse Damper is a patented, wide-dynamic-range 316 stainless steel device that smooths pulsations and maintains constant flow at system pressures from 500 to 6,000 psi (3,447 to 41,369 kPa). The flow path volume is only 0.9 mL and the path is efficiently swept, eliminating solvent memory effects when changing mobile phases.

The LO-Pulse pulse damper also is available in a space-saving, economical kit that includes hardware for mounting the pulse damper on a bracket, or for installing feet on it for bench-top use.

Description	qty.	cat.#
Model LP-21 LO-Pulse Pulse Damper	ea.	25012
Pulse Damper Kit	kit	25013

**UHP Pulse Dampener**

The UHP Pulse Dampener provides minimal flow pulsation at system pressures up to 18,000 psi. Its low dead volume (220  $\mu\text{L}$  at atmospheric pressure) reduces overall system volume for UHP applications. The UHP Pulse Dampener has a stainless steel fluid path.

**Specifications:**

Operating Pressure:	0–18,000psi
Pulsation Damping:	3:1 reduction in pulsation (dependent on pump characteristics and system volume and pressure)
Fluid Path Volume:	220 $\mu\text{L}$ (atmospheric pressure) +44 $\mu\text{L}$ (per 1,000psi system pressure)
Wetted Materials:	316 SS; PTFE; Teflon
Dimensions:	2.5" diameter x 2.0" high

Description	qty.	cat.#
UHP Pulse Dampener	ea.	26549

**Solvent Debubbler**

Bubbles in an HPLC system can cause check valve malfunctions and pump cavitation, seriously affecting pump performance. The debubbler removes bubbles from the fluid stream before it enters the pump.



25014

Special geometry at the base of the housing allows bubbles entrained in the inlet fluid stream to rise and be trapped in the reservoir. The gas/liquid interface is easily visible through the translucent wall of the device. Loosening the airtight cap releases the trapped gas. The debubbler is fitted with a bracket and universal connecting tips.

Description	qty.	cat.#
Solvent Debubbler with Bracket	ea.	25014

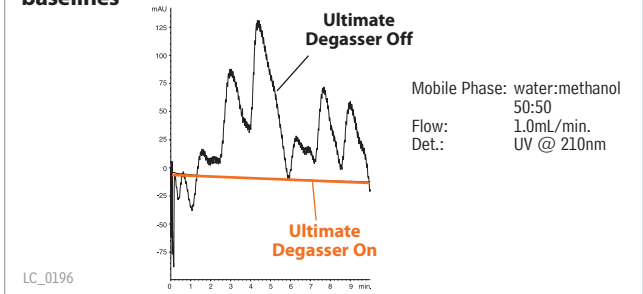


### Mobile Phase Degasser

Dissolved oxygen can cause flow rate instability and increased baseline noise. Also, it has a quenching effect on fluorescence detection and increases the background of UV detectors. Dissolved gases can out-gas in the HPLC system, forming bubbles in check valves, at connections, or in detector flow cells.

In-line vacuum degassing is more effective at removing dissolved gas from mobile phases than sonication or helium sparging. In-line degassers work by withdrawing gas across a gas-permeable membrane encased in a sealed chamber. Traditionally, the membrane has been made of PTFE tubing, but the Degasys Ultimate Degasser uses tubing composed of an amorphous fluoropolymer that is 200 to 300 times more gas permeable than PTFE. This translates into the ability to use shorter tubing for removing dissolved gas. This new material also has better tubular burst strength than PTFE. To prevent cross contamination, each channel on this Degasys unit is individually encased within its own vacuum chamber.

#### Degasys Ultimate Degasser provides highly stable baselines



To prevent system damage, do not use the Degasys system with solutions containing TFA at concentrations greater than 5%.

#### Specifications:

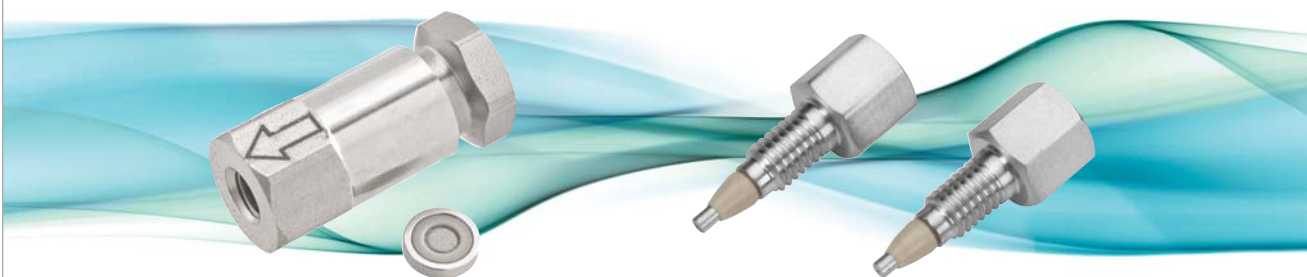
<b>Residual Oxygen<sup>1</sup></b>	0.9ppm	<b>Wetted Parts</b>	Teflon AF, PTFE, ETFE, PPS
<b>Pressure Loss<sup>2</sup></b>	0.24psi (1.65kPa)	<b>Max Flow Rate</b>	7mL/min./channel
<b>Internal Volume</b>	500 $\mu$ L		

<sup>1</sup>At a flow rate of 1mL/min.

Description	Voltage	qty.	cat.#
Mobile Phase Degasser (4 Channel, 7mL/min./channel)	110V	ea.	25189
Mobile Phase Degasser (4 Channel, 7mL/min./channel)	220V	ea.	25194

## Protect your column and system performance with UltraShield and UltraLine UHPLC Filters

A cost-effective way to extend the lifetime of any UHPLC column without sacrificing UHPLC performance



See page 195 for details.



25008

### Low-Pressure Slip-On Inlet Filter for Mobile Phase Reservoir

A type 316 stainless steel tip with a Tefzel® collar seals to a corrosion-resistant type 316 stainless steel filter element. The slip-on filter easily attaches to the pump inlet line, without the use of wrenches. The universal tip accommodates standard Teflon® tubing inner diameters. The cylindrical filter is standard 10 µm porosity. 1/8" OD. Fits Altex, ISCO, LDC, Varian, Waters, PerkinElmer, and other pumps.

Description	qty.	cat.#
Slip-on Inlet Filter	ea.	25008



25009

### Low-Pressure CPI Inlet Filter for Mobile Phase Reservoir

A 316 stainless steel knurled cap and Tefzel® CPI ferrule seal to 1/8" OD Teflon® tubing when finger-tightened onto the precision-machined filter holder. The filter element is replaceable. Standard 10 µm porosity protects delicate pump components from particles but introduces very little pressure drop. 1/8" OD. May be used as a helium sparging diffuser.

Description	qty.	cat.#
CPI Inlet Filter	ea.	25009
Replacement Elements: 10µm filter	2-pk.	25010

### Mobile Phase Sparge Filter; Inlet Filter

The 2 µm helium sparge filter is an inexpensive way to prepare and maintain mobile phases free of dissolved gas. Both filters are made from 316 stainless steel and PEEK™ and are compatible with most solvents.



25311

Description	qty.	cat.#
Mobile Phase Sparge Filter: 2µm	ea.	25311
Inlet Filter: 10µm	ea.	25312
Inlet Filter: 20µm	ea.	25313

### Last Drop Filter

The flat filter element sits parallel to the bottom of the mobile phase reservoir, allowing the filter to draw 98% of the mobile phase without drawing air into the system. Conventional cylindrical mobile phase filters begin to draw air into the system when approximately 10% of the solvent remains in the reservoir. The Last Drop Filter allows more analyses per batch of mobile phase and helps reduce hazardous waste. 22.1 mm OD.



25314

Description	qty.	cat.#
Last Drop Filter, 2µm	ea.	25314
Last Drop Filter, 10µm	ea.	25315



also  
available

Trident Direct high-pressure filter—  
protection against particulate matter.  
See **page 197** for details.



KT953825-0000



Polypropylene Membrane Filters

### Membrane Microfiltration Glassware

47 mm filtration apparatus with fritted glass support is recommended for routine filtration of corrosive liquids and removal of particles from HPLC solvents. The ground joint connection eliminates phthalate contamination that can occur when using silicone or neoprene stoppers. The support base has a coarse porosity glass frit and an integral vacuum connection, located above the drip tip to prevent contamination of the vacuum line with filtrate droplets. Each apparatus includes a funnel, an anodized aluminum clamp, a 47 mm fritted glass support base, and a filtration flask.

All-Glass Microfiltration Apparatus	qty.	cat.#
300mL Funnel, 1000mL Flask	ea.	KT953825-0000
500mL Funnel, 2000mL Flask	ea.	KT953835-0000
1000mL Funnel, 4000mL Flask	ea.	KT953845-0000
Replacement Parts for Microfiltration Apparatus	qty.	cat.#
40/35 PTFE Joint Sleeve	6-pk.	KT676001-4035
Flask Cap, 40/35 Outer Joint	ea.	KT953830-0000
Fritted Glass Support, 47mm, 40/35 Joint	ea.	KT953826-0000
Glass Funnel, 47mm, 100mL	ea.	KT953761-0000
Glass Funnel, 47mm, 300mL	ea.	KT953751-0000
Glass Funnel, 47mm, 500mL	ea.	KT953771-0000
Glass Funnel, 47mm, 1000mL	ea.	KT953781-0000
Flask, 1000mL, 40/35 Joint	ea.	KT953827-0000
Flask, 2000mL, 40/35 Joint	ea.	KT953828-0000
Flask, 4000mL, 40/35 Joint	ea.	KT953829-0000
Aluminum Clamp, 47mm	ea.	KT953753-0000
Membrane Filters	qty.	cat.#
Polypropylene Membrane Filters, 47mm, 0.45µm	100-pk.	26396
Polypropylene Membrane Filters, 47mm, 0.22µm	100-pk.	26397
Nylon Membrane Filters, 47mm, 0.45µm	100-pk.	26398
Nylon Membrane Filters, 47mm, 0.22µm	100-pk.	26399



26516



### Sidewinder Column Heater

- Easy to set up!
- Operation range: 5 °C above ambient to 85 °C, ±1 °C.
- Lightweight, compact design fits in small spaces.
- Column holder can be placed in any orientation.

This unique design completely encloses any HPLC analytical column up to 25 cm in length. Two lengths of heater jackets are available: the short column holder accommodates columns up to 10 cm in length, while the long column holder holds columns up to 25 cm in length. The control module provides optimum heating performance, accuracy to within 1 °C, and stability to within 0.1 °C. The new Sidewinder controller has fast 10 Hz sampling for improved responsiveness. Power requirements: 24 V control unit for maximum stability; RS232 control allows external programming.

Description	Length	qty.	cat.#
Temperature Control Module and Column Holder	Long (25cm)	ea.	26516
Temperature Control Module and Column Holder	Short (10cm)	ea.	26517



26518



### Sidewinder Heater/Cooler Temperature Control Module

- Operation range: 5-55 °C, ±0.2 °C.
- Ability to program multiple temperature points.
- Accommodates columns up to 30 cm in length and 7.8 mm ID.
- Compact design.

The Sidewinder heater/cooler unit has a doubly insulated cover to maintain the programmed temperature to within 0.2 °C. The 24 V control unit provides maximum stability and rapid equilibration times; RS232 control allows external programming.

Description	qty.	cat.#
Sidewinder Heater/Cooler Temperature Control Module	ea.	26518



22484



### Mobile Phase Pre-Heater

- Heats mobile phase before it enters a heated column.
- Minimizes temperature changes, to help keep analyte peaks sharp.

Description	qty.	cat.#
15µL Mobile Phase Pre-heater, 0.010" ID	ea.	22484



25328



25336



25342

### QuickSplit Post-Column Flow Splitters

Fluid resistor technology eliminates adjustments to capillary tubing for optimizing split ratio. Wide range of interchangeable resistors available.

### Fixed Flow Splitters for HPLC & LC/MS

- Split ratio not affected by changes in viscosity or pressure.
- High operating pressure limit: 10,000 psi (68,948 kPa).
- Low dead volume—negligible effect on analyte bandwidth.
- Total flow: 0.1–5.0 mL/min.

### Adjustable Flow Splitter

- Adjustable metering valve gives convenient control of split ratio.
- Split ratio not affected by changes in viscosity or pressure.
- High operating pressure limit: 5,000 psi (34,474 kPa).
- Low dead volume—negligible effect on analyte bandwidth.
- Total flow: 0.1–5.0 mL/min.

Description	Split Ratio	qty.	cat.#
Binary Fixed, Post Column	100:1	ea.	25326
	50:1	ea.	25327
	20:1	ea.	25328
	10:1	ea.	25329
	5:1	ea.	25330
Replacement Fixed Resistor Set, Post Column	100:1	ea.	25331
	50:1	ea.	25332
	20:1	ea.	25333
	10:1	ea.	25334
	5:1	ea.	25335
Adjustable, Post Column	5:1 to 100:1	ea.	25336
	1:1 to 20:1	ea.	25337
	50:1 to 1000:1	ea.	26416
Replacement Adjustable Resistor Set, Post Column	5:1 to 100:1	ea.	25338
	1:1 to 20:1	ea.	25339

### HPLC Mixers

- Reduced baseline noise.
- Increased sensitivity.
- Improved gradient accuracy, for more reproducible results.
- Increased reaction efficiency in post-column derivatization.

An efficient cross-flow shearing mechanism and interchangeable cartridges produce vortex shear mixing over a wide range of flows. Stainless steel or PEEK™.

### HyperShear™ Static In-Line Mixers

Volume	Stainless Steel		PEEK	
	qty.	cat.#	qty.	cat.#
1µL	ea.	26409	ea.	26410
25µL	ea.	26411	ea.	26412
50µL	ea.	25341	ea.	26413
150µL	ea.	25342	ea.	26414
250µL	ea.	25343	ea.	26415



25138

### Ternary Tee Mixer

Description	Volume	qty.	cat.#
Ternary Tee Mixer	25µL	ea.	25138



26400



26401



25017

25018

25020



26404



26406

### Valves for HPLC

Our valves have low internal volumes and are rated to 15,000 psi (103,421 kPa). They feature a 2-piece stem assembly in which the rotating upper shank is coupled through a ball joint to a static lower stem. Only fingertight torque is required to make the seal.

Description	qty.	cat.#
Two-Way Through Valve for HPLC, 1/16" Fittings, 1/4-28, Stainless Steel, Includes Nuts and Ferrules	ea.	26400
Two-Way Angle Valve for HPLC, 1/16" Fittings, 1/4-28, Stainless Steel, Includes Nuts and Ferrules	ea.	26401
Three-Way Bottom Vent Valve for HPLC, 1/16" Fittings, 1/4-28, Stainless Steel, Includes Nuts and Ferrules	ea.	26402
Side Vent Valve for HPLC, 1/16" Fittings, 1/4-28, Stainless Steel, Includes Nuts and Ferrules	ea.	26403
Dual Stem Three Way Valve for HPLC, 1/16" Fittings, 1/4-28, Stainless Steel, Includes Nuts and Ferrules	ea.	26404
Prime/Purge Valve for HPLC, 1/4-28 Flanged Seat, Stainless Steel, with Tubing and Fittings	ea.	26406
Prime/Purge Valve Repair Kit for Prime/Purge Valve	kit	26407

### Backpressure Regulators

Backpressure regulators can improve detector performance by preventing bubble formation in the detector flow cell. They also are useful in post-column reaction lines and between detectors and fraction collectors in preparatory work. Regulators are superior to more specific alternative solutions, like small-bore tubing, in which pressure varies with flow rate.

Our end-of-line and flow-through backpressure regulators are adjustable to assure constant backpressure over a wide range of mobile-phase viscosities and flow rates. The end-of-line model is available with 1/4-28 plastic flange-type fittings or high-pressure 1/16-inch compression fittings; this design adjusts from 15 to 60 psi (103 to 414 kPa). The flow-through design has 1/16-inch compression fittings and is adjustable from 7 to 75 psi (48 to 517 kPa).

Description	qty.	cat.#
Backpressure Regulator: end-of-line, 1/16-inch OD tubing, flanged	ea.	25017
Backpressure Regulator: end-of-line, high-pressure seat	ea.	25018
Backpressure Regulator: flow-through, 5µL internal volume	ea.	25020



26405



26417

### In-Line Check Valves for HPLC

Description	Max Pressure	qty.	cat.#
Check Valve, Soft Seat, for HPLC, 1/16" Fittings, 1/4-28, Stainless Steel, Includes Nuts and Ferrules	15,000psi	ea.	26405
Check Valve with 1/8" Ball Cartridge, 48µL internal volume	15,000psi	ea.	26417
Check Valve Replacement 1/8" Ball Cartridge, 48µL internal volume	15,000psi	ea.	26418
UHP Check Valve with 1/8" Ball Cartridge, 48µL internal volume	30,000psi	ea.	26419
UHP Check Valve Replacement 1/8" Ball Cartridge, 48µL internal volume	30,000psi	ea.	26420
Check Valve with 3/16" Ball Cartridge, 60µL internal volume	15,000psi	ea.	26421
Check Valve Replacement 3/16" Ball Cartridge, 60µL internal volume	15,000psi	ea.	26422