TRAP COLUMNS

Trapping is a chromatography technique that allows for the concentration or purification of a sample. A trap cartridge is a packed column bed loaded with a material to create desirable conditions for separating the target compound from the rest of the sample matrix. This is accomplished by selecting a packing material that has a strong affinity for the target compound causing the analyte to be retained in the trap while the rest of the sample matrix flows through; or by selecting a material which has no affinity for the target compound but that binds other unwanted matrix components such as salts, detergents and contaminants.

Trap columns are uni-directional or bi-directional and are used either on-line or off-line for sample pre-concentration and clean-up. Trap column bed materials need not be similar to the primary LC column bed materials and can be selected based on sample clean-up needs. Desirable characteristics of a trap include low back pressure, bi-directional flow, a robust bed, the ability to regenerate the packed bed and low swept volume.

To learn more about LC or LC/MS off-line and on-line trapping, please refer to the LC Trapping Guide on pages 75-87.

TRAP CARTRIDGE SELECTION GUIDES

In an effort to consolidate part numbers, options and associated stationary phases, trap cartridge part numbers are condensed in tables on the following pages .

HOW TO USE OUR SELECTION GUIDES

Find the five digits matching the required trap dimensions. Then, identify the two letter packing code for the phase.
Example: a single 5µL cartridge with SCX phase will be part number 10-04815-TP.

	Bed Volume	Dimensions	Dimension Code	Code	Phase
SINGLES	0.5µL	0.5 x 2mm	0 4 8 1 3	T P	SCX
	5µL	1 x 8mm	0 4 8 1 5	T Q	Small Molecule
	50µL	3 x 8mm	0 4 8 1 7	E S	Custom
2			1 0 – 0 4 8 1 5	T P	

Part Number

GUIDE TO OPTIMIZE TRAP COLUMNS

	OPTI-TRAP™	OPTI-LYNX™	OPTI-LYNX™2	EXP®2	EXP®2	EXP®
	Column	Micro Trap	Trap	Nano Trap	Stem Trap	Trap Column
Maximum Pressure	MEDIUM PRESSURE 1.5K PSI / 100 BAR	HIGH PRESSURE 6K PSI / 400 BAR	HIGH PRESSURE *see below	ULTRA HIGH PRESSURE 20K+ PSI / 1400+ bar	ULTRA HIGH PRESSURE 20K+ PSI / 1400+ BAR	ULTRA HIGH PRESSURE 20K+ PSI / 1400+ BAR
Bed Volumes Available	0.5µL 5µL 50µL	4µL 10µL 20µL 40µL	20µL 40µL 100µL	.12µL .30µL 1µL	.17µL .33µL .68µL 1.5µL 2.6µL	4µL 10µL 20µL 40µL 100µL >100µL / Custom
Custom Packing Available	✔	✔	✔	✔	✔	✔
Holder Configurations	In-Line & Manual (off-line)	In-Line & Direct-Connect	In-Line & Direct-Connect	In-Line & Direct-Connect	Direct-Connect	In-Line & Direct-Connect
Hand-Tight Holder Hand-Tight Cartridge Change	✔	✔	✔	✔	✔	✔
Holder Thread Type(s)	10-32	10-32	10-32	6-32 6-40 10-32	10-32	10-32
Holder Fittings Included	✔	✔	✔	✔	✔	✔
Auto Adjusting (ZDV) Port Connection	N/A	✔ Spring-loaded	✔ Spring-loaded	✔ Spring-loaded	✔ Floating	✔ Spring-loaded
Biocompatible Option	✔	✔				

* Please contact Optimize for pressure rating and further product details.

OPTI-TRAP™

MP MEDIUM PRESSURE
1,500psi /100bar

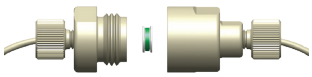
The OPTI-TRAP is a bi-directional trap cartridge system which is used individually or in a series for sample concentration and purification. The OPTI-TRAP system features a durable biocompatible trap holder assembly made of either PEEK (capillary configuration) or stainless steel with a PEEK flow path (micro and macro configurations). OPTI-TRAPs feature low back pressure and are loaded and eluted manually with a syringe or on-line when plumbed into the sample injection valve. OPTI-TRAPs include titanium frits for full biocompatibility.

OPTI-TRAP™ Advantages

- Rated hand-tight for use up to 1,500 psi (100 bar)
- Low back pressure, for syringe loading/eluting or on-line trapping
- Transparent cartridge allows for visual inspection of bed
- Bi-directional cartridge for flushing and bed regeneration
- Color coded band for identification of packing material
- PEEK and titanium flow path for biocompatibility

Manual Holder Kit

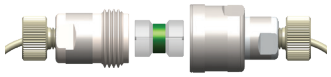
Capillary (0.5µL): **10-02-04749**
Micro (5µL): **10-02-04745**
Macro (50µL): **10-02-04747**



In-Line Capillary Holder Kit (0.5µL)

Includes fittings and tubing

10-02-04808



In-Line Micro / Macro Holder Kit (5 & 50µL)

Includes fittings and tubing

10-02-04751

OPTI-TRAP™ CARTRIDGE SELECTION GUIDE

		Bed Volume	Dimensions	Load Rate (mL/min)	Dimension Code	Code	Phase	Band
SINGLES	Cap	0.5µL	0.5 x 2mm	0.005 - 0.020	0 4 8 1 3	T M	Protein	Black
	Micro	5µL	1 x 8mm	0.05 - 0.20	0 4 8 1 5	T N	Peptide	Green
	Macro	50µL	3 x 8mm	0.5 - 2	0 4 8 1 7	T O	NID	Blue
6 PACKS	Cap	0.5µL	0.5 x 2mm	0.005 - 0.020	0 4 8 1 4	T P	SCX	Orange
	Micro	5µL	1 x 8mm	0.05 - 0.20	0 4 8 1 6	T Q	Small Molecule	Purple
	Macro	50µL	3 x 8mm	0.5 - 2	0 4 8 1 8	E S	Custom	Gray

To calculate the approximate sample capacity of each trap cartridge, we recommend using the ratio 4µg/1µL of bed volume. For more information about how to use this table, please see page 29.

1 0 – [ ][ ][ ][ ][ ] [ ][ ]
Part Number

OPTI-**LYNX™** MICRO

HP HIGH PRESSURE
6,000psi / 400bar

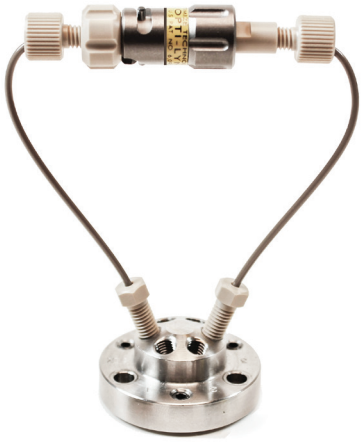
The new OPTI-LYNX Micro offers chromatographers a versatile selection of packed bed cartridges coupled with a convenient quick-connect holder. Many options are available for on-line and off-line sample pre-concentration and clean-up. Each cartridge shares the same external dimensions allowing different dimensions and porosities to be used in the same holder hardware. Two styles of holders are available. The OPTI-LYNX Micro In-Line Holder offers full biocompatibility, while the Direct Connect version threads conveniently into all 10-32 ports.

OPTI-LYNX Traps are the ideal tool for optimizing trapping techniques. Whether separating a peptide digest from its matrix for further analyses or preparing a dilute small molecule sample for LC injection without loss of sample, these columns may be loaded and regenerated repeatedly for maximum value.

OPTI-**LYNX™** Micro Advantages

- Hand-tight quick-connect (quarter-turn) system
- Rated to 6,000 psi - no tools needed
- In-line (BC) and Direct-Connect configurations
- Biocompatible bi-directional cartridges
- New compact design offering lower backpressure
- Larger bed volumes available upon request

In-Line Holder Configuration



OPTI-LYNX™ Micro Holders

11-04824-AA	OPTI-LYNX Micro Direct Connect Holder Includes back-end fitting
11-03924-AA	OPTI-**LYNX Micro** In-Line Holder Includes fittings and tubing

OPTI-**LYNX™** MICRO CARTRIDGE SELECTION GUIDE

	Bed Volume	Dimensions	Load Rate (mL/min)	Dimension Code	Code	Phase
5 PACKS	4µL	1 x 5mm	0.10 - 5	0 4 7 5 5	T A	C18
					T B	SCX
					T D	C18AQ
					T E	SAX
	10µL	1.5 x 5mm	0.20 - 8	0 4 7 5 7	T F	C8
					T G	C4
					T H	DVB
					D Q	DVB/SCX
	20µL	2.1 x 5mm	0.50 - 12	0 4 7 5 9	T M	Protein
					T N	Peptide
					T O	NID
	40µL	3.0 x 5mm	1 - 15	0 4 8 0 7	T Q	Small Molecule
					E S	Custom

To calculate the approximate sample capacity of each trap cartridge, we recommend using the ratio 4µg/1µL of bed volume. For more information about how to use this table, please see page 29.

1 0 - [ ][ ][ ][ ][ ] [ ][ ]

Part Number

EXP®2 NANO TRAP

UHP ULTRA HIGH PRESSURE
20,000+psi / 1,400+bar

The next-generation EXP2 Nano Trap System provides the finest low-volume hardware and connections to minimize extra column effects and sample dispersion. The EXP2 Nano Trap is extremely versatile and robust for applications requiring trapping in one direction followed by elution in the reverse direction. Applications for the EXP2 Nano Trap include general sample cleanup, sample concentration and removal of detergents or salts at UHPLC pressures.

EXP2 Nano Trap Holders are available in two formats: 10-32 threaded connections for 1/16" tube ports and 6-40 threaded connections for 1/32" tube ports. Multiple bed volumes and phases allow customizable formats to achieve the separation, clean up and concentration most effective for a specific method. Please note the 6-40 holder can be connected to a 6-32 port with the purchase of EXP or EXP2 Fittings. If you are working with 6-32 threads and have questions, please contact an Optimize representative.

The new hand-tight EXP2 Fittings allow the Nano Trap to achieve the highest performance at UHPLC pressures while maintaining a small profile to fit tight spaces in switching valves or injection valves. The Nano Trap is best coupled with narrow bore (25µm, 50µm, 100µm) PEEKsil® tubing to deliver top performance.

EXP®2 NANO TRAP SELECTION GUIDE

SINGLE TRAP

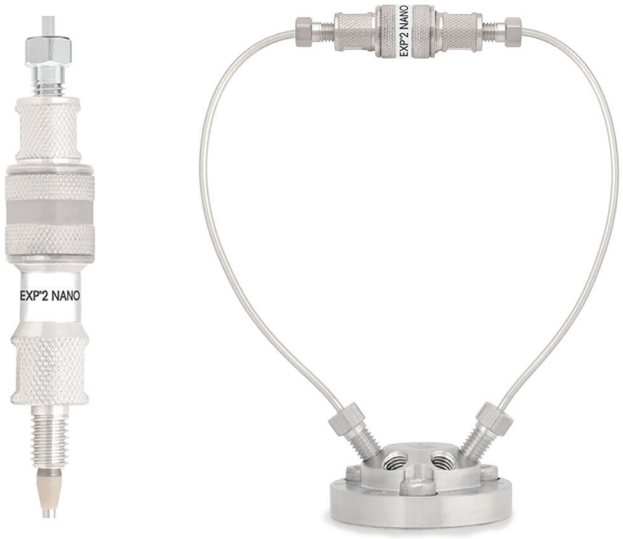
Bed Volume	Load Rate (mL/min)	Dimensions	Dimension Code	Code	Phase	
0.125µL	0.02 - 0.2	180µm x 5mm	0 5 0 9 2	H P	C18	5µm HALO®
				H Q	C8	
				H R	HILIC	
				H S	Phenyl-Hexyl	
				H T	PFP	
				H U	ES-CN	
				H V	Penta-HILIC	
0.30µL	0.05 - 0.75	350µm x 5mm	0 5 1 1 9	H A	C18	2.7µm HALO®
				H B	C8	
				H D	HILIC	
				H E	RP-Amide	
				H F	Phenyl-Hexyl	
				H N	Peptides ES-C18	
1µL	0.10 - 2	500µm x 5mm	0 5 1 1 7	H G	C18	3µm EXP®
				H H	C8	
				H I	C4	
				H J	HILIC	
				H K	Phenyl-Hexyl	
				H L	SAX	
				H M	SCX	
				E S	Custom	

1 5 – ☐☐☐☐☐ ☐☐

Part Number

To calculate the approximate sample capacity of each trap cartridge, we recommend using the ratio 4µg/1µL of bed volume.
For more information about how to use this table, please see page 29.

EXP®2 NANO TRAP DIRECT CONNECT & IN-LINE HOLDERS



EXP®2 Nano Trap Holders

15-02-05036	EXP2 Nano Trap Direct Connect Holder Includes EXP Fitting, connects to any 10-32 port
15-02-05107	EXP2 Nano Trap In-Line Holder Kit with 10-32 Threads Includes 2 EXP Fittings
15-02-05088	EXP2 Nano Trap In-Line Holder Kit with 6-40 Threads Includes 2 EXP Fittings

Advantages of the **EXP®2** Nano Trap

- Rated to 20,000+ psi (1,400+ bar)
- Reduced column volume for superior performance
- For multi-directional and uni-directional trapping
- Lowest swept volume design for peak sharpness

EXP®2 STEM TRAP

ULTRA HIGH PRESSURE
20,000+psi / 1,400+bar

The entire EXP2 Stem Trap and reusable holder are only slightly larger than a standard HPLC fitting. The slim architecture allows it to easily fit into crowded instrument compartments or to connect directly to tightly-spaced injection ports. When tightened by hand, the EXP2 Stem Trap seals to 8,700+ psi. All configurations incorporate wrench flats to enable flawless sealing to 20,000+ psi (1,400+ bar). The unique packed floating stem installs directly into any 10-32 port and automatically adjusts to provide a perfect ZDV connection.

Specialized features, patented technology, precision engineering and state-of-the-art manufacturing make the new EXP2 Stem Trap an unbeatable choice for ultra high-pressure trapping applications.

EXP®2 Stem Holder

15-02-03996 EXP2 Stem Holder
Includes fittings

actual size

EXP®2 STEM TRAP SELECTION GUIDE

	Bed Volume	Load Rate (mL/min)	Dimensions	Dimension Code	Code	Phase	
STEM TRAP KIT	0.17µL	0.005 - 0.1	125µm x 13.5mm	0 3 9 9 7	H P H Q H R H S H T H U H V	C18 C8 HILIC Phenyl-Hexyl PFP ES-CN Penta-HILIC	5µm HALO®
REPLACEMENT STEMS (3 PK)	0.17µL			0 3 9 9 2			
STEM TRAP KIT	0.33µL	0.01 - 0.25	180µm x 13.5mm	0 4 0 0 3			
REPLACEMENT STEMS (3 PK)	0.33µL			0 4 0 0 1	H A H B H D H E H F H N	C18 C8 HILIC RP-Amide Phenyl-Hexyl Peptides ES-C18	2.7µm HALO®
STEM TRAP KIT	0.68µL	0.02 - 0.5	250µm x 13.5mm	0 4 0 0 9			
REPLACEMENT STEMS (3 PK)	0.68µL			0 4 0 0 8			
STEM TRAP KIT	1.5µL	0.05 - 1	350µm x 13.5mm	0 4 0 1 5	H G H H H I H J H K H L H M	C18 C8 C4 HILIC Phenyl-Hexyl SAX SCX	3µm EXP®
REPLACEMENT STEMS (3 PK)	1.5µL			0 4 0 1 4			
STEM TRAP KIT	2.6µL	0.10 - 2	500µm x 13.5mm	0 4 0 2 1			
REPLACEMENT STEMS (3 PK)	2.6µL			0 4 0 2 0	E S	Custom	

1 5 – [ ][ ][ ][ ][ ] [ ][ ]

Part Number

To calculate the approximate sample capacity of each trap cartridge, we recommend using the ratio 4µg/1µL of bed volume.
For more information about how to use this table, please see page 29.

EXP®2

STEM TRAP KIT

Holder

Fitting

Stems

Advantages of the **EXP®2** Stem Trap

- Rated to 20,000+ psi (1,400+ bar)
- Hand-tight and wrench-tight configuration
- Custom packing available
- Available in bed volumes from 0.17µL to 2.6µL
- Low-volume, low-dispersion cartridges
- Auto-adjusting ZDV connection
- Intended for many repeat uses
- For nano flow applications
- New design incorporates integral ferrule into the front-end of the holder. No separate ferrule to lose.

EXP® TRAP COLUMN

UHP ULTRA HIGH PRESSURE
20,000+psi / 1,400+bar

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

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

EXP® Holders

15-02-03956	EXP Direct Connect Holder Includes fittings
15-02-03946	EXP In-Line Holder Includes fittings
15-02-04041	EXP All-In-One Holder Kit Includes In-Line + Direct Connect holder components and fittings

EXP® TRAP CARTRIDGE SELECTION GUIDE

3 PACKS

Bed Volume	Load Rate (mL/min)	Dimensions	Dimension Code	Code	Phase	
4µL	0.10 - 5	1 x 5mm	0 3 9 6 4	H P H Q H R H S H T H U H V	C18 C8 HILIC Phenyl-Hexyl PFP ES-CN Penta-HILIC	5µm **HALO®**
10µL	0.20 - 8	1.5 x 5mm	0 3 9 6 9			
20µL	0.50 - 12	2.1 x 5mm	0 3 9 7 3	H A H B H D H E H F H N	C18 C8 HILIC RP-Amide Phenyl-Hexyl Peptides ES-C18	2.7µm **HALO®**
40µL	1 - 15	3 x 5mm	0 3 9 7 8	H G H H H I H J H K H L H M	C18 C8 C4 HILIC Phenyl-Hexyl SAX SCX	3µm **EXP®**
100µL	1 - 20	4.6 x 5mm	0 3 9 8 3	E S	Custom	

1 5 – ☐☐☐☐☐ ☐☐

Part Number

To calculate the approximate sample capacity of each trap cartridge, we recommend using the ratio 4µg/1µL of bed volume.
For more information about how to use this table, please see page 29.

EXP®

IN-LINE HOLDER

EXP®

DIRECT CONNECT HOLDER

Advantages of the **EXP®** Trap Column

- Hand-tight to 20,000+ psi (1,400+ bar)
- Hand-tight trap replacement - no tools
- Uni-directional cartridge
- Custom packing available
- Available in bed volumes from 4µL to 100µL
- Hardened stainless steel end cap eliminates galling
- Auto-adjusting ZDV connections