



General Information

Since 1962, Nor-Cal Products has been designing and building standard and custom foreline traps for the vacuum industry. These traps range in complexity from the sealed coaxial traps, which prevent oil backstreaming, to the triple-pass water cooled traps, which remove condensable gasses that contaminate mechanical pump oil or other parts of the system. Typically, our customers realize a 200% improvement in preventative maintenance intervals after installing one of these traps.

All traps disassemble easily with a Viton® O-ring and V-clamp, with the exception of our sealed coaxial metal sieve traps which have a one piece body. The two piece body allows for easy removal for cleaning or replacement. Standard finish for all traps is beadblast. Electropolish finish is available on request.

Options

Copper Sieve Option “-CS”

The standard metal sieve filter is stainless steel. Copper metal sieve filters are available at no additional cost for all sealed and two-piece metal sieve traps.

240 Volt Heater Option “-240V”

The standard molecular sieve trap regeneration heater is 120V. 240V heaters are available as an option at no additional cost. Other voltages are also available.

ISO Body Flange Option “-BF”

All 4, 6 and 8 inch OD trap bodies can be supplied with ISO clamp style flanges as an alternative to V-clamps.

- 4" Body Add
- 6" Body Add
- 8" Body Add

Quick Disconnect Option “-QD”

Immediately shut off water flow from both directions for single-handed, no-spill removal of a water cooled trap from the system for preventative maintenance or O-ring replacement.

Add

Fiberglass Particulate Filter Option “-F”

This filter is recommended for temperatures up to 370°C.

Add

High Capacity Particulate Filter Option “-L7”

This fiberglass filter provides a reservoir for applications with heavy particle loads that might block the inlet. Available on 6" bodies only. See diagram at right.

Add

OPTIONS PART NUMBER CONFIGURATION MATRIX

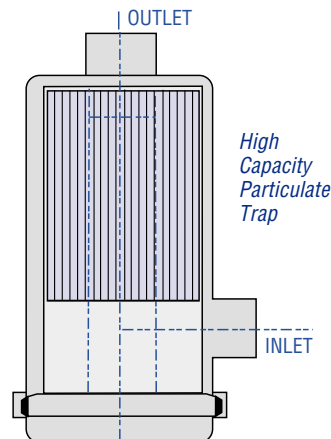
When ordering a trap with options, please follow the option order sequence below when building the part number. For example, when ordering a particulate trap with an ISO flange body and fiberglass, high capacity filter, the part number would read: FTPA-6-2002-NWB-BF-L7

FORELINE TRAP TYPE	PARENT PART NUMBER	OPTION 1	OPTION 2
METAL SIEVE	FCT-X-XXX	BF*	CS
	CT-X-XXX	BF*	CS
	FTA-X-XXX	BF*	CS
WATER COOLED	FTWS-X-XXX	BF #	QD
	FTWA-X-XXX	BF #	QD
PARTICULATE	FTPA-X-XXX	BF	F or L7**
	FTPS-X-XXX	BF	F or L7**
LIQUID NITROGEN	FTN-X-XXX	BF	-
	FTNA-X-XXX	BF	-
	NTD-X-XXX	BF	-
	NTDA-X-XXX	BF	-
MOLECULAR SIEVE	FTM-X-XXX	BF	240V
	FTMA-X-XXX	BF	240V
	FTMS-X-XXX	BF	240V

* Available only on four, six and eight inch diameter bodies

** "L7" Option available only with six inch bodies

Not available with 4.5" bodies



Prices subject to change without notice. - International product pricing will vary.

TRAPA-LIT 7/02



New Products

Three Stage
LPCVD/TEOS
Foreline Trap



Single and Multistage LPCVD-TEOS Traps

Increase your system's throughput and extend preventative maintenance intervals by two times or more with Nor-Cal Products' multistage LPCVD-TEOS foreline traps. All three traps have a stainless steel gauze filter to collect crystalline TEOS before it reaches downstream components. The two and three stage traps also have a fiberglass filter to remove silicon dioxide. The three stage trap's final stage is a reservoir to collect liquid TEOS without restricting foreline conductance. Coaxial or right angle bodies are available with 3 or 4 inch port sizes. See page 11.

Oil Mist Eliminators

During rotary vane pump operation, oil mist escapes from the exhaust port; mainly when pumping between atmospheric pressure and 1 mbar. Oil mist eliminators retain oil mist contained in the exhausted gases with a high level of separation; an internal over pressure valve prevents exceeding the maximum permissible exhaust pressure. See page 16.



Custom Foreline Traps

Standard trap designs are readily altered or custom models are designed and fabricated to improve performance for your specific application. Some examples are described below. Call for more information or to discuss your application requirements.

Liquid Recovery Traps

Nor-Cal has provided many types of condensation traps for liquid collection before they enter the pump. Often they have valves or drains to allow the liquid to be collected and reused. Some of the liquids collected include photo resist, oil and tantalum.

High Capacity Particulate Traps

Nor-Cal can provide high-capacity particle traps with several liter capacities for applications with large particle loads, such as silicon wafer processing.



Custom
High Capacity
Particulate
Trap

Liquid Nitrogen Traps

High capacity liquid nitrogen traps can be furnished for customers who require larger LN2 capacity to extend the time between refills or larger trapping capacity for condensable by-product.

High Capacity Water Cooled

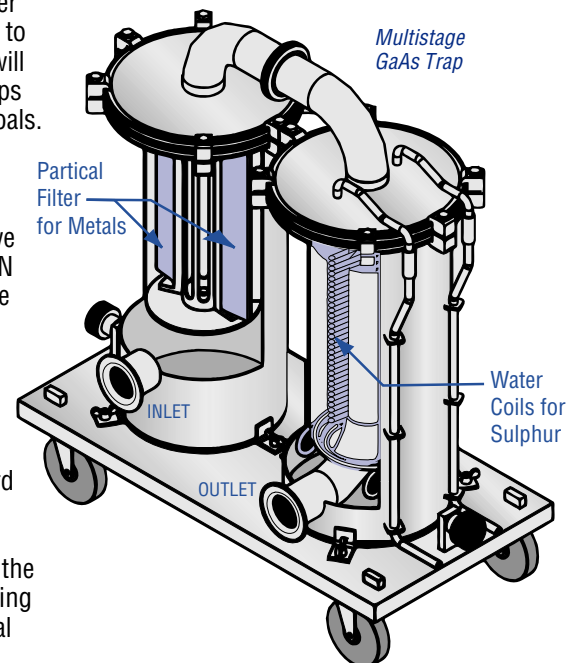
Semiconductor CVD equipment manufacturers require high wafer counts between preventative maintenance. Unlike other manufacturers who offer one solution to fit a number of applications, Nor-Cal will design high-capacity water-cooled traps to achieve specific customer-stated goals. Port geometry, capacity, conductance and efficiency are adjusted in order to produce the optimal design for the application. Examples of processes we have provided solutions for include TiN barrier layer deposition, LPCVD Nitride and III-Vs MOCVD.

Electropolish or Nickelplate Finish

Electropolish finish inside and out is available upon request for all standard and custom traps. Electropolished traps are easier to clean because the surface is more highly polished than the standard beadblast finish. Nickleplating is available upon request for additional corrosion resistance. Call for pricing.

Multistage Traps

Multi-stage traps can be furnished for processes that require a combination of trap media, such as water-cooling and particle filtration. The trap shown here was developed for a GaAs MOCVD process. The first stage particle filter removes heavy metals, while the water cooled second stage collects sulfur.



Multistage
GaAs Trap



Foreline Trap Selection Table

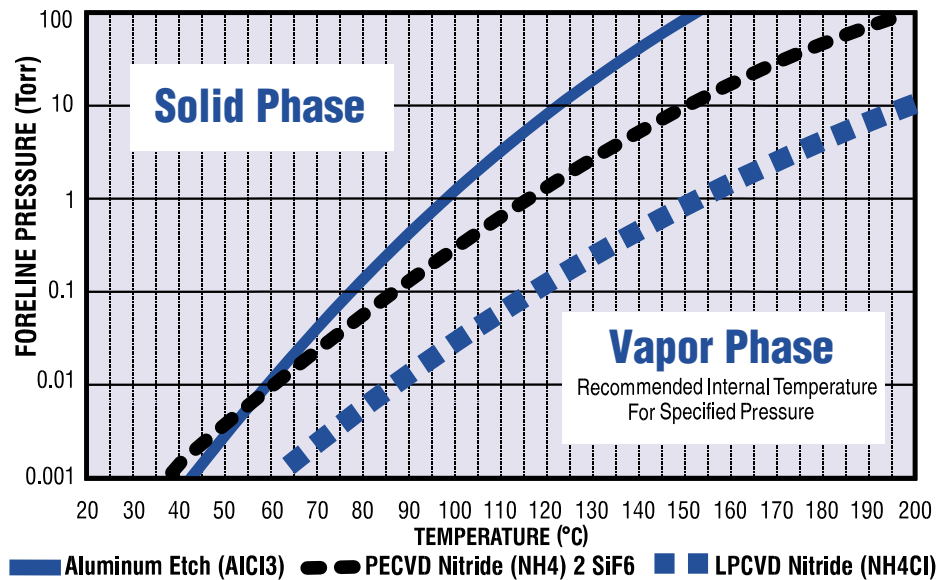


TRAP APPLICATION	Metal Sieve		Molecular	Cold		Particulate	
	Stainless Steel	Copper	Zeolite	LN ²	H ₂ O	Polyester	Fiberglass
Oil Backstream	+	++	++	+++			
Water Vapor			++	+++			
Organics				++	+		
Acid Vapors				++			
Particles	<149°C	+	+			+++	+++
	<370°C	+	+				+++
Condensibles	Low Vapor Pressure	++	++		+++	+++	
	High Vapor Pressure	+	+		+++	+	

Temperature Guide for Specific Semiconductor Processes

Our experience coupled with a broad product offering allows us to integrate components, providing comprehensive solutions to semiconductor fabs and equipment manufacturers. To improve overall system performance and achieve customer defined goals, a thorough evaluation of the system is conducted. A detailed worksheet is posted on our website for you to download. Filling out this worksheet will greatly assist us in calculating your cost of ownership model. A cost of ownership model can show pay-back as a result of increased tool utilization and decreased maintenance costs.

Foreline traps, thermal products, Intellisys™ pressure control valves, Genesis™ soft start valves and weldments can be provided as turnkey modules. Thermal and vacuum characterization can be performed at Nor-Cal before the assembly is supplied, leak checked, blanked off and clean room packaged.



Download a
**Comprehensive Downstream
Solutions Worksheet**
from our website at
www.n-c.com/nctraps.htm
Complete worksheet and
fax to 530-842-9130.



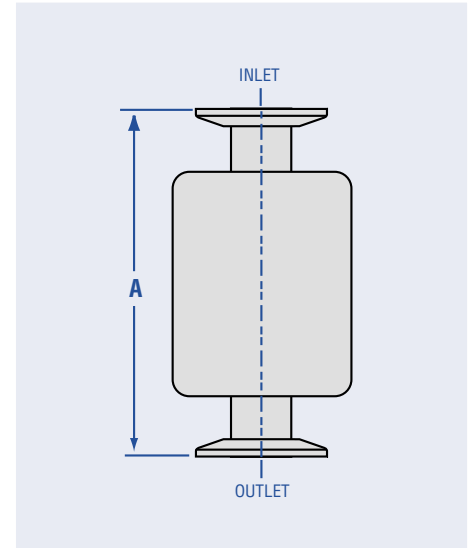
Sealed traps contain a fibrous stainless steel sieve which eliminates hydrocarbons backstreaming toward the chamber when the mechanical pump oil is at its vapor pressure. Copper sieve can also be provided as an option at no additional cost. The unibody construction requires removal of the trap from the system for cleaning. The two inch OD body size is available from stock with port ODs from .50 to one inch, while the four inch is available with port ODs from .75 to two inches. Larger body sizes, CF and ASA flanges are available on request. Standard finish is beadblast. Electropolish is also available. Call for pricing.

Sealed Coaxial Metal Sieve Traps

Body OD	Model Number	Flanges	A	Port OD	Price
2.00*	CT-2-050	-	8.07	.50	
	CT-2-0502-NWB	NW-10B	8.37	.50	
	CT-2-075	-	8.07	.75	
	CT-2-0752-NWB	NW-16B	8.37	.75	
	CT-2-100	-	8.07	1.00	
	CT-2-1002-NWB	NW-25B	8.37	1.00	
4.00	CT-4-075	-	10.00	.75	
	CT-4-0752-NWB	NW-16B	10.30	.75	
	CT-4-100	-	10.00	1.00	
	CT-4-1002-NWB	NW-25B	10.30	1.00	
	CT-4-150	-	10.00	1.50	
	CT-4-1502-NWB	NW-40B	10.30	1.50	
	CT-4-200	-	10.00	2.00	
	CT-4-2002-NWB	NW-50B	10.30	2.00	

* ISO body flange option not available for 2" trap bodies

Dimensions in inches



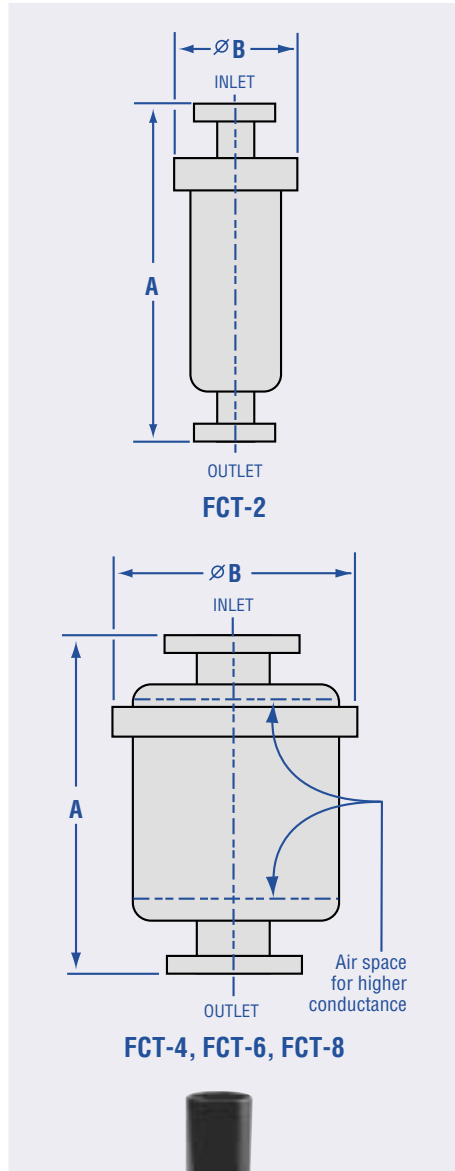
Options (See page 2)

- Copper Sieve Filters



Nor-Cal metal sieve traps are provided with a fibrous stainless steel sieve for removal of hydrocarbons which backstream toward the chamber when the mechanical pump oil is at its vapor pressure. Copper sieve is also available as an option at no additional cost. The metal sieve trap's two-piece clamped body design makes disassembly, cleaning and sieve replacement a simple task. For proper sealing, apply a light coating of Krytox lube when cleaning or replacing the O-ring. Standard finish is beadblast. Electropolish finish is also available. Larger body sizes, CF and ASA flanges are also available. Call for pricing.

Coaxial Metal Sieve Traps



Body OD	Model Number	Flanges	Port OD	A	B	Price	
2.00*	FCT-2-050	-	.50	8.23	3.56		
	FCT-2-0502-NWB	NW-10B	.50	8.53	3.56		
	FCT-2-075	-	.75	8.23	3.56		
	FCT-2-0752-NWB	NW-16B	.75	8.53	3.56		
	FCT-2-100	-	1.00	8.23	3.56		
	FCT-2-1002-NWB	NW-25B	1.00	8.53	3.56		
4.00	FCT-4-075	-	.75	10.00	4.80		
	FCT-4-0752-NWB	NW-16B	.75	10.30	4.80		
	FCT-4-100	-	1.00	10.00	4.80		
	FCT-4-1002-NWB	NW-25B	1.00	10.30	4.80		
	FCT-4-150	-	1.50	10.00	4.80		
	FCT-4-1502-NWB	NW-40B	1.50	10.30	4.80		
	FCT-4-200	-	2.00	10.00	4.80		
	FCT-4-2002-NWB	NW-50B	2.00	10.30	4.80		
6.00	FCT-6-150	-	1.50	10.00	6.90		
	FCT-6-1502-NWB	NW-40B	1.50	10.30	6.90		
	FCT-6-200	-	2.00	10.00	6.90		
	FCT-6-2002-NWB	NW-50B	2.00	10.30	6.90		
	FCT-6-250	-	2.50	10.00	6.90		
	FCT-6-2502-ISO	ISO-63-250-OF	2.50	10.50	6.90		
	FCT-6-300	-	3.00	10.00	6.90		
	FCT-6-3002-ISO	ISO-80-300-OF	3.00	10.50	6.90		
	FCT-6-400	-	4.00	10.00	6.90		
	FCT-6-4002-ISO	ISO-100-400-OF	4.00	10.50	6.90		
	8.00	FCT-8-200	-	2.00	13.00	9.00	
		FCT-8-2002-NWB	NW-50B	2.00	13.30	9.00	
FCT-8-250		-	2.50	13.00	9.00		
FCT-8-2502-ISO		ISO-63-250-OF	2.50	13.50	9.00		
FCT-8-300		-	3.00	13.00	9.00		
FCT-8-3002-ISO		ISO-80-300-OF	3.00	13.50	9.00		
FCT-8-400		-	4.00	13.00	9.00		
FCT-8-4002-ISO		ISO-100-400-OF	4.00	13.50	9.00		

* ISO body flange option not available for 2" trap bodies

Dimensions in inches

Options (See page 2)

- ISO Body Flanges
- Copper Sieve Filters



Prices subject to change without notice. - International product pricing will vary.

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Angle Metal Sieve Traps

Body OD	Model Number	Flanges	Port OD	A	B	C	D	Price
2.00*	FTA-2-050	-	.50	6.79	3.56	5.23	2.50	
	FTA-2-0502-NWB	NW-10B	.50	6.94	3.56	5.38	2.65	
	FTA-2-075	-	.75	6.79	3.56	5.10	2.50	
	FTA-2-0752-NWB	NW-16B	.75	6.94	3.56	5.25	2.65	
	FTA-2-100	-	1.00	6.79	3.56	4.98	2.50	
	FTA-2-1002-NWB	NW-25B	1.00	6.94	3.56	5.13	2.65	
4.00	FTA-4-075	-	.75	8.42	4.80	6.52	3.50	
	FTA-4-0752-NWB	NW-16B	.75	8.57	4.80	6.67	3.65	
	FTA-4-100	-	1.00	8.42	4.80	6.40	3.50	
	FTA-4-1002-NWB	NW-25B	1.00	8.57	4.80	6.55	3.65	
	FTA-4-150	-	1.50	8.42	4.80	6.14	3.50	
	FTA-4-1502-NWB	NW-40B	1.50	8.57	4.80	6.29	3.65	
	FTA-4-200	-	2.00	8.42	4.80	5.89	3.50	
	FTA-4-2002-NWB	NW-50B	2.00	8.57	4.80	6.04	3.65	
6.00	FTA-6-150	-	1.50	8.50	6.90	5.00	4.50	
	FTA-6-1502-NWB	NW-40B	1.50	8.65	6.90	5.15	4.65	
	FTA-6-200	-	2.00	8.50	6.90	4.75	4.50	
	FTA-6-2002-NWB	NW-50B	2.00	8.65	6.90	4.90	4.65	
	FTA-6-300	-	3.00	8.50	6.90	4.62	4.50	
	FTA-6-3002-ISO	ISO-80-300-OF	3.00	8.75	6.90	5.00	4.75	
	FTA-6-400	-	4.00	8.50	6.90	4.12	4.50	
	FTA-6-4002-ISO	ISO-100-400-OF	4.00	8.75	6.90	4.50	4.75	
8.00	FTA-8-200	-	2.00	11.50	9.00	7.63	5.50	
	FTA-8-2002-NWB	NW-50B	2.00	11.65	9.00	7.78	5.65	
	FTA-8-300	-	3.00	11.50	9.00	7.13	5.50	
	FTA-8-3002-ISO	ISO-80-300-OF	3.00	11.75	9.00	7.50	5.75	
	FTA-8-400	-	4.00	11.50	9.00	6.63	5.50	
	FTA-8-4002-ISO	ISO-100-400-OF	4.00	11.75	9.00	7.00	5.75	

* ISO body flange option not available for 2" trap bodies

Dimensions in inches

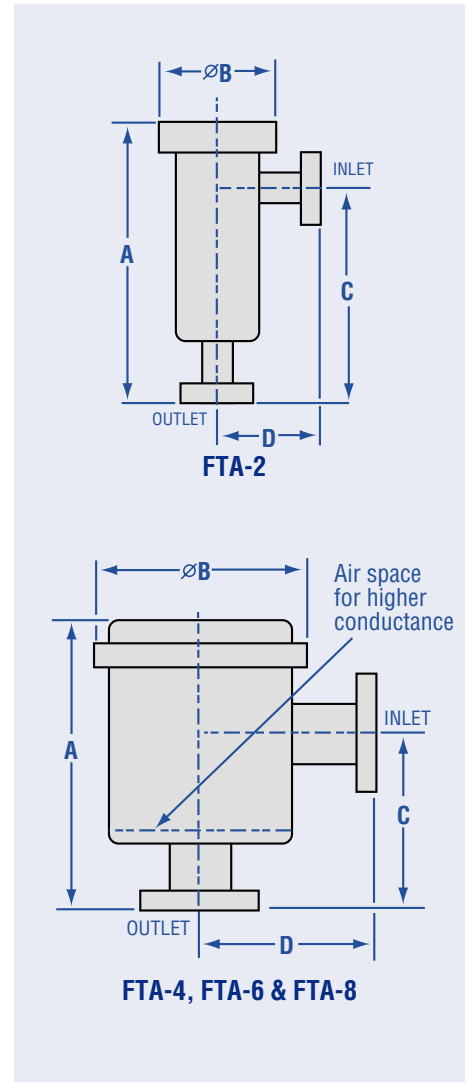
Options (See page 2)

- ISO Body Flanges
- Copper Sieve Filters

Replacement Metal Sieves

Body OD	Model Number	Description	Price
2.00	FT-2-SS	Stainless Steel	
	FT-2-CS	Copper	
4.00	FT-4-SS	Stainless Steel	
	FT-4-CS	Copper	
6.00	FT-6-SS	Stainless Steel	
	FT-6-CS	Copper	
8.00	FT-8-SS	Stainless Steel	
	FT-8-CS	Copper	

Other replacement hardware located on page 17



Prices subject to change without notice. - International product pricing will vary.

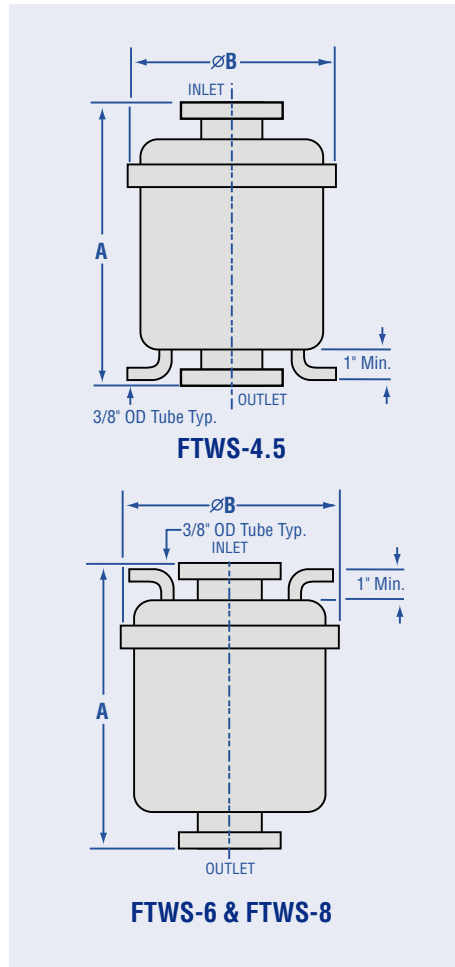
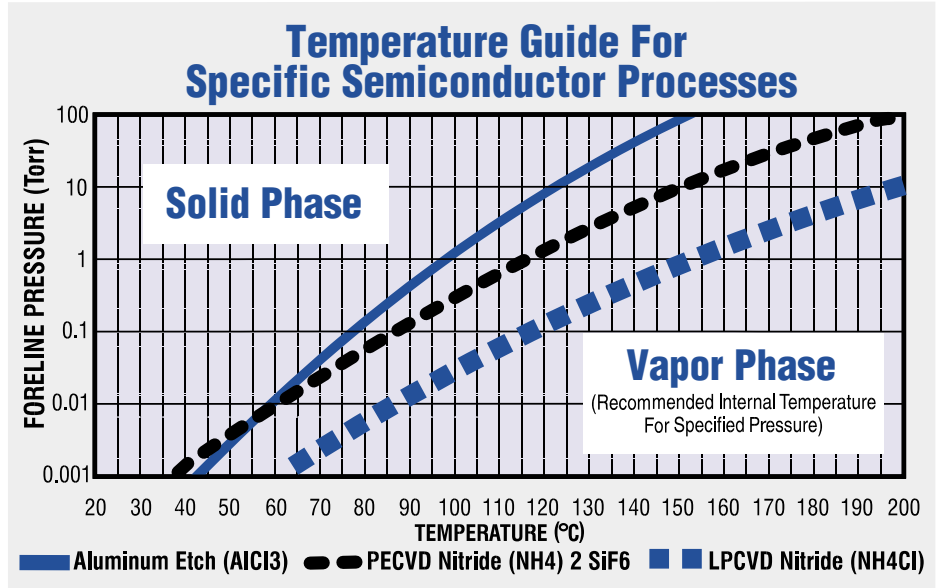
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Water cooled traps protect mechanical pumps and other downstream components from condensable process gasses and their by-products. They can extend or eliminate preventative maintenance intervals and pump overhauls. Nor-Cal's unique water cooled traps have up to three coils of corrosion resistant 316 stainless steel tubing to provide a large surface area. Internal baffles combined with the coils create a perilous path for the gas flow, maximizing resident time and increasing contact between the gas and the coils. Depending on the application, house water or refrigerated water can be used to achieve the required temperature to cause by-products to pass from gas to solid phase.

A thirty to fifty psi water supply is required. Anticipate a 2 gpm flow rate.

The two-piece trap body and 304 stainless steel construction allow these traps to be easily cleaned. For proper sealing, apply a light coating of Krytox lube when cleaning or replacing the O-ring. Standard finish is beadblast. Electropolish finish, right angle configurations, larger body sizes and CF or ASA flanges are also available. Call for pricing. Quick Disconnect Fittings immediately shut off water flow from both directions for single handed, no-spill removal of the trap from the system for preventative maintenance or O-ring replacement. Available as an option.



Coaxial Water Cooled Traps

Body OD	Model Number	Flanges	Port OD	A	B	Price
4.50*	FTWS-4.5-150	-	1.50	9.45	5.28	
	FTWS-4.5-1502-NWB	NW-40B	1.50	9.75	5.28	
	FTWS-4.5-200	-	2.00	9.45	5.28	
	FTWS-4.5-2002-NWB	NW-50B	2.00	9.75	5.28	
6.00	FTWS-6-150	-	1.50	10.00	6.90	
	FTWS-6-1502-NWB	NW-40B	1.50	10.30	6.90	
	FTWS-6-200	-	2.00	10.00	6.90	
	FTWS-6-2002-NWB	NW-50B	2.00	10.30	6.90	
	FTWS-6-250	-	2.50	10.00	6.90	
	FTWS-6-2502-ISO	ISO-63-250-OF	2.50	10.50	6.90	
	FTWS-6-300	-	3.00	10.00	6.90	
	FTWS-6-3002-ISO	ISO-80-300-OF	3.00	10.50	6.90	
8.00	FTWS-8-200	-	2.00	13.00	9.00	
	FTWS-8-2002-NWB	NW-50B	2.00	13.30	9.00	
	FTWS-8-250	-	2.50	13.00	9.00	
	FTWS-8-2502-ISO	ISO-63-250-OF	2.50	13.50	9.00	
	FTWS-8-300	-	3.00	13.00	9.00	
	FTWS-8-3002-ISO	ISO-80-300-OF	3.00	13.50	9.00	
	FTWS-8-400	-	4.00	13.00	9.00	
	FTWS-8-4002-ISO	ISO-100-400-OF	4.00	13.50	9.00	

* ISO flange body option not available for 4.5" trap bodies

Dimensions in inches

Options (See page 2)

- ISO Body Flanges
- Quick Disconnect Fittings

Prices subject to change without notice. - International product pricing will vary.

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Angle Water Cooled Traps

Body OD	Model Number	Flanges	Port OD	A	B	C	D	Price
4.50*	FTWA-4.5-150	-	1.50	7.40	5.28	3.75	5.90	
	FTWA-4.5-1502-NWB	NW-40B	1.50	7.55	5.28	3.90	6.05	
	FTWA-4.5-200	-	2.00	7.40	5.28	3.75	5.90	
	FTWA-4.5-2002-NWB	NW-50B	2.00	7.55	5.28	3.90	6.05	
6.00	FTWA-6-150	-	1.50	8.50	6.90	4.50	5.25	
	FTWA-6-1502-NWB	NW-40B	1.50	8.65	6.90	4.65	5.40	
	FTWA-6-200	-	2.00	8.50	6.90	4.50	5.25	
	FTWA-6-2002-NWB	NW-50B	2.00	8.65	6.90	4.65	5.40	
	FTWA-6-250	-	2.50	8.50	6.90	4.50	5.25	
	FTWA-6-2502-ISO	ISO-63-250-OF	2.50	8.75	6.90	4.75	5.50	
	FTWA-6-300	-	3.00	8.50	6.90	4.50	5.25	
	FTWA-6-3002-ISO	ISO-80-300-OF	3.00	8.75	6.90	4.75	5.50	
8.00	FTWA-8-200	-	2.00	11.50	9.00	5.50	6.62	
	FTWA-8-2002-NWB	NW-50B	2.00	11.65	9.00	5.65	6.77	
	FTWA-8-250	-	2.50	11.50	9.00	5.50	6.62	
	FTWA-8-2502-ISO	ISO-63-250-OF	2.50	11.75	9.00	5.75	7.87	
	FTWA-8-300	-	3.00	11.50	9.00	5.50	6.62	
	FTWA-8-3002-ISO	ISO-80-300-OF	3.00	11.75	9.00	5.75	6.87	
	FTWA-8-400	-	4.00	11.50	9.00	5.50	6.62	
	FTWA-8-4002-ISO	ISO-100-400-OF	4.00	11.75	9.00	5.75	6.87	

* ISO flange body option not available for 4.5" trap bodies

Dimensions in inches

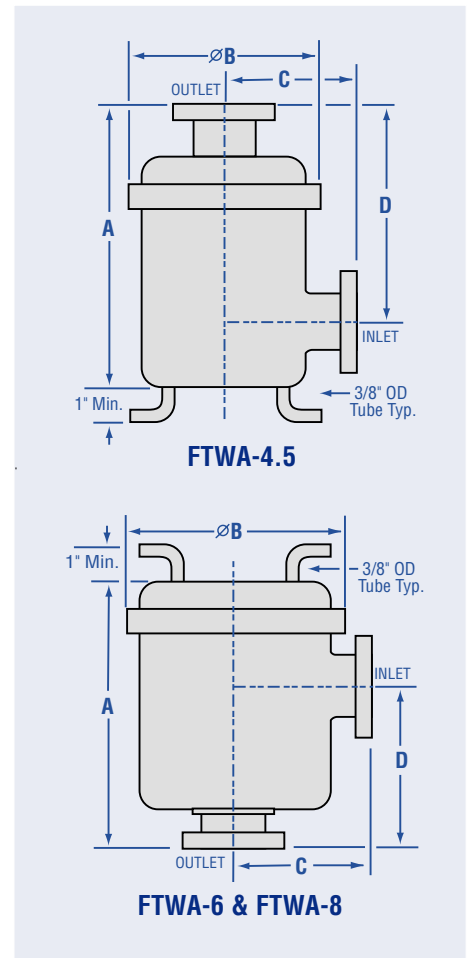
Options (See page 2)

- ISO Body Flanges
- Quick Disconnect Fittings



Quick Disconnect Fittings Kit

Model Number	Fits Tube OD	Description	Cost
FTW-QD	.375	Two double-end shut off fittings (DESO)	



Prices subject to change without notice. - International product pricing will vary.

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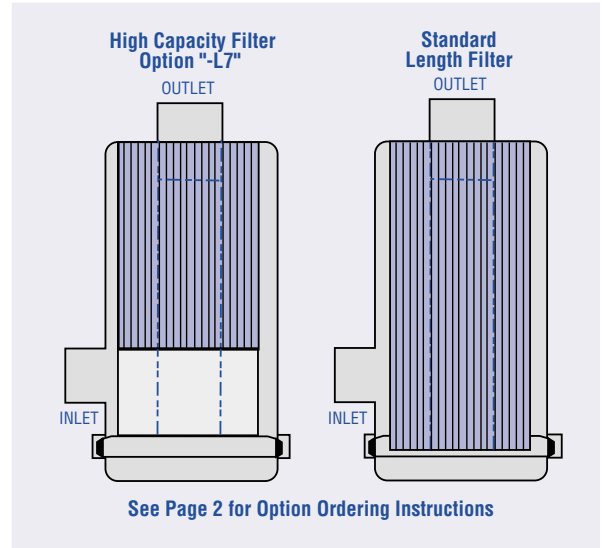


These traps remove particles that might enter the mechanical pump and contaminate the oil. A polyester felt filter traps particles over 10 microns in size at 98% efficiency. Filters can be cleaned with a vacuum cleaner. Suitable for process temperatures from ambient to 149°C.

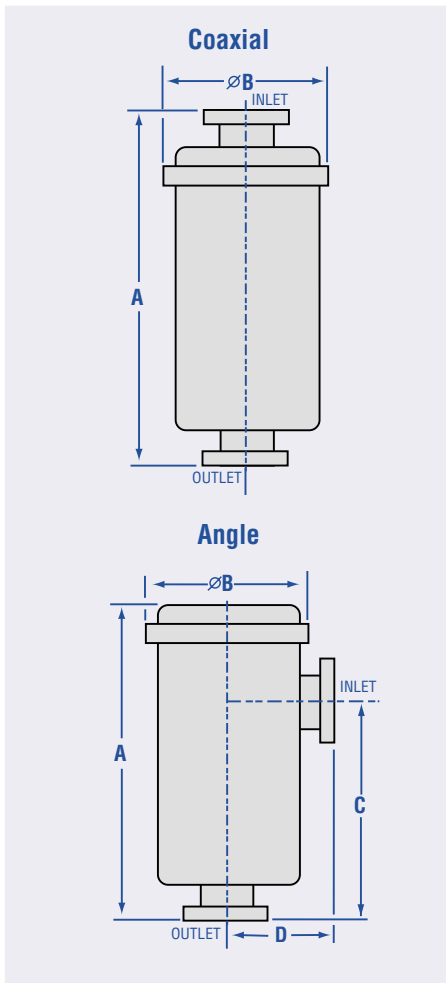
Woven 10 micron fiberglass filters are available as an option. These filters provide a much longer service life than the polyester. This filter is required for temperatures greater than 149°C. Maximum fiberglass filter temperature is 370°C. Filters with other micron ratings are available upon request.

The high capacity fiberglass filter option, shown in the diagram to right, provides a reservoir for applications with heavy particle loads that might block the inlet. The high capacity filter option is not available for 8" bodies.

The two-piece trap body and 304 stainless steel construction allow these traps to be easily cleaned. For proper sealing, apply a light coating of Krytox lube when cleaning or replacing the O-ring. Standard finish is beadblast. Electropolish finish, larger body sizes and custom flange configurations available. Call for pricing.



Angle Particulate Traps



Body OD	Model Number	Flanges	Port OD	A	B	C	D	Price
6.00	FTPA-6-150	-	1.50	13.75	6.90	10.25	4.50	
	FTPA-6-1502-NWB	NW-40B	1.50	13.90	6.90	10.40	4.65	
	FTPA-6-200	-	2.00	13.75	6.90	10.00	4.50	
	FTPA-6-2002-NWB	NW-50B	2.00	13.90	6.90	10.15	4.65	
8.00*	FTPA-8-150	-	1.50	13.75	9.00	10.25	5.50	
	FTPA-8-1502-NWB	NW-40B	1.50	13.90	9.00	10.40	5.65	
	FTPA-8-200	-	2.00	13.75	9.00	10.00	5.50	
	FTPA-8-2002-NWB	NW-50B	2.00	13.90	9.00	10.15	5.65	

*High Capacity Filter not available for 8" body

Dimensions in inches

Coaxial Particulate Traps

Body OD	Model Number	Flanges	Port OD	A	B	Price
6.00	FTPS-6-150	-	1.50	16.00	6.90	
	FTPS-6-1502-NWB	NW-40B	1.50	16.30	6.90	
	FTPS-6-200	-	2.00	16.00	6.90	
	FTPS-6-2002-NWB	NW-50B	2.00	16.30	6.90	
8.00*	FTPS-8-150	-	1.50	16.00	9.00	
	FTPS-8-1502-NWB	NW-40B	1.50	16.30	9.00	
	FTPS-8-200	-	2.00	16.00	9.00	
	FTPS-8-2002-NWB	NW-50B	2.00	16.30	9.00	

*High Capacity Filter not available for 8" body

Dimensions in inches

Replacement Filters

Body OD	Model Number	Description	Price
6.00 or 8.00	FT-6-PP	11.5" Length Polyester Felt Particulate Trap Filter	
6.00 or 8.00	FT-6-PF	11.5" Length Woven Fiberglass Particulate Trap Filter	
6.00 only	FT-6-PF-L7	7.5" Length High Capacity Woven Fiberglass Filter	

Other hardware located on page 17

Dimensions in inches

Options (See page 2)

- ISO Body Flanges
- Woven Fiberglass Filter
- High Capacity Fiberglass Filter

Prices subject to change without notice. - International product pricing will vary.

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Increase your system's throughput and extend preventative maintenance intervals by two times or more with Nor-Cal Products' LPCVD/TEOS multi-stage foreline traps. The first stage is a stainless steel gauze filter which collects crystalline TEOS before it reaches downstream piping and isolation valves. The second stage is a 10 micron fiberglass filter which removes silicon dioxide which causes frequent PMs in throttling butterfly valves. The third and final stage is a reservoir which collects liquid TEOS without restricting foreline conductance. The two-piece trap body and 304 stainless steel construction allow these traps to be easily cleaned. Standard finish is beadblasted. Electropolish is also available on request. Call for pricing.

One Stage LPCVD-TEOS Traps

Body OD	Model Number	Port Config.	Flanges	Port ID	A	B	C	Price
8.00	FTT1S-8-3002-ISO	Coaxial	ISO-80	3.00	16.84	9.00	-	
8.00	FTT1A-8-3002-ISO	Angle	ISO-80	3.00	15.09	5.75	12.06	
8.00	FTT1S-8-4002-ISO	Coaxial	ISO-100	4.00	16.84	9.00	-	
8.00	FTT1A-8-4002-ISO	Angle	ISO-100	4.00	15.09	5.75	12.06	

Includes one stainless steel gauze filter

Dimensions in inches

Two Stage LPCVD-TEOS Traps

Body OD	Model Number	Port Config.	Flanges	Port ID	A	B	C	Price
8.00	FTT2S-8-3002-ISO	Coaxial	ISO-80	3.00	19.12	9.45	-	
8.00	FTT2A-8-3002-ISO	Angle	ISO-80	3.00	21.00	5.75	18.00	
8.00	FTT2S-8-4002-ISO	Coaxial	ISO-100	4.00	19.12	9.45	-	
8.00	FTT2A-8-4002-ISO	Angle	ISO-100	4.00	21.00	5.75	18.00	

Includes one stainless steel gauze filter and one 10 micron fiberglass filter

Dimensions in inches

Three Stage LPCVD-TEOS Traps

Body OD	Model Number	Port Config.	Flanges	Port ID	A	B	C	Price
8.00	FTT3S-8-3002-ISO	Coaxial	ISO-80	3.00	19.12	9.45	-	
8.00	FTT3A-8-3002-ISO	Angle	ISO-80	3.00	21.00	5.75	18.00	
8.00	FTT3S-8-4002-ISO	Coaxial	ISO-100	4.00	19.12	9.45	-	
8.00	FTT3A-8-4002-ISO	Angle	ISO-100	4.00	21.00	5.75	18.00	

Includes one stainless steel gauze filter and one 10 micron fiberglass filter

Dimensions in inches

Replacement Filters

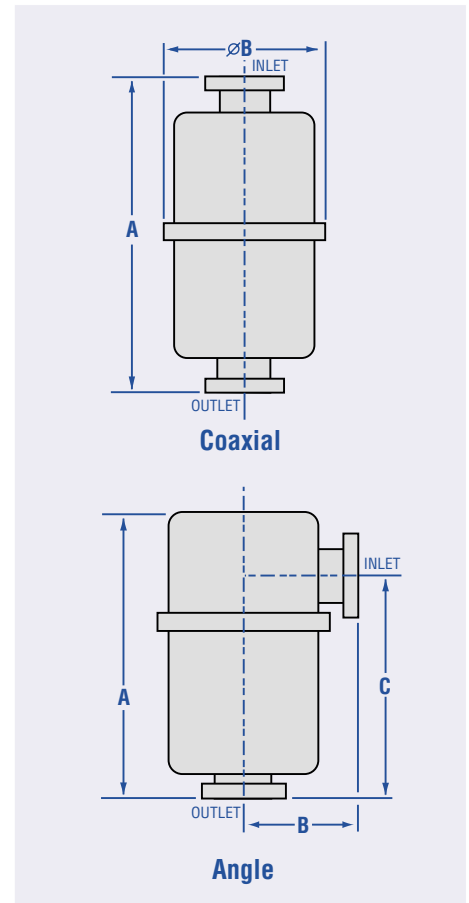
Body OD	Model Number	Filter Material	Fits Traps	Price
8.00	FT-8-SS	Stainless Steel Gauze	One stage, FTT1	
	FT-8-SS-5	Stainless Steel Gauze	Two and three stage, FTT2 and FTT3	
	FT-8-PF-5	Woven Fiberglass	Two and three stage, FTT2 and FTT3	

Other replacement hardware is located on page 17

Dimensions in inches

Prices subject to change without notice. - International product pricing will vary.

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LIQUID NITROGEN TRAPS



Nor-Cal's liquid nitrogen traps are used to remove condensible gasses before they enter the mechanical pump and contaminate the oil. They also prevent oil vapors from the mechanical pump from contaminating the chamber. These traps actually act as a pump producing lower base pressures and faster pump down. The dual-tube trap can be attached to an automatic fill tube, eliminating the need for refilling the reservoir with liquid nitrogen.

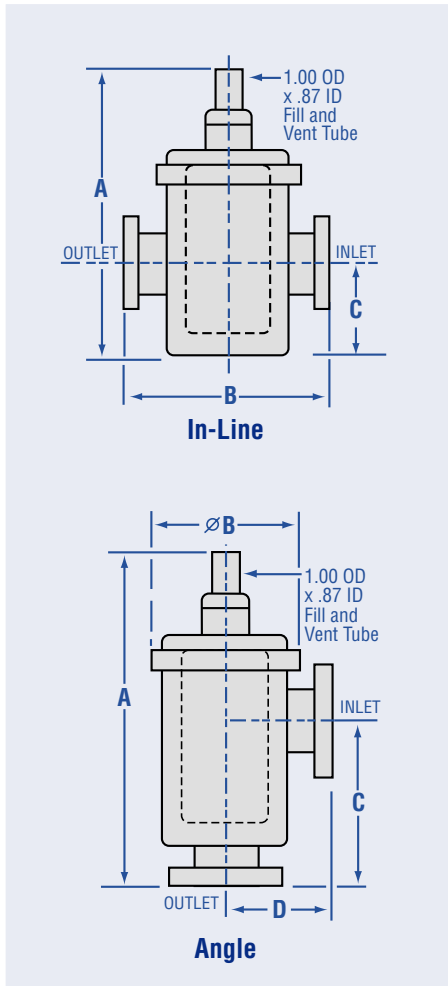


The maximum duration of time between refills on the single tube models is as follows:

4 inch diameter	8 hours
6 inch diameter	11 hours
8 inch diameter	18 hours

The two-piece trap body and 304 stainless steel construction allow these traps to be easily cleaned without disassembling the system. For proper sealing, apply a light coating of Krytox lube when cleaning or replacing the O-ring. Coaxial port configurations, ISO, CF or ASA flanges and electropolish finish available. Call for pricing.

In-Line Liquid Nitrogen Traps



Body OD	Model Number	Flanges	Port OD	A	B	C	LN ₂ Reservoir	Price
4.00	FTN-4-075	-	.75	11.50	7.00	3.70	.75 Liter	
	FTN-4-0752-NWB	NW-16B	.75	11.50	7.30	3.70	.75 Liter	
	FTN-4-100	-	1.00	11.50	7.00	3.70	.75 Liter	
	FTN-4-1002-NWB	NW-25B	1.00	11.50	7.30	3.70	.75 Liter	
	FTN-4-150	-	1.50	11.50	7.00	3.70	.75 Liter	
	FTN-4-1502-NWB	NW-40B	1.50	11.50	7.30	3.70	.75 Liter	
6.00	FTN-6-150	-	1.50	14.20	9.00	4.50	1.60 Liter	
	FTN-6-1502-NWB	NW-40B	1.50	14.20	9.30	4.50	1.60 Liter	
	FTN-6-200	-	2.00	14.20	9.00	4.50	1.60 Liter	
	FTN-6-2002-NWB	NW-50B	2.00	14.20	9.30	4.50	1.60 Liter	
8.00	FTN-8-150	-	1.50	15.25	11.00	5.00	4.00 Liter	
	FTN-8-1502-NWB	NW-40B	1.50	15.25	11.30	5.00	4.00 Liter	
	FTN-8-200	-	2.00	15.25	11.00	5.00	4.00 Liter	
	FTN-8-2002-NWB	NW-50B	2.00	15.25	11.30	5.00	4.00 Liter	

Dimensions in inches

Angle Liquid Nitrogen Traps

Body OD	Model Number	Flanges	Port OD	A	B	C	D	LN ₂ Reservoir	Price
4.00	FTNA-4-075	-	.75	13.00	4.80	7.03	3.50	.75 Liter	
	FTNA-4-0752-NWB	NW-16B	.75	13.30	4.80	7.18	3.65	.75 Liter	
	FTNA-4-100	-	1.00	13.00	4.80	6.91	3.50	.75 Liter	
	FTNA-4-1002-NWB	NW-25B	1.00	13.30	4.80	7.06	3.65	.75 Liter	
	FTNA-4-150	-	1.50	13.00	4.80	6.65	3.50	.75 Liter	
	FTNA-4-1502-NWB	NW-40B	1.50	13.30	4.80	7.80	3.65	.75 Liter	
6.00	FTNA-6-150	-	1.50	15.70	6.90	8.25	4.50	1.6 Liter	
	FTNA-6-1502-NWB	NW-40B	1.50	16.00	6.90	8.40	4.65	1.6 Liter	
	FTNA-6-200	-	2.00	15.70	6.90	8.00	4.50	1.6 Liter	
	FTNA-6-2002-NWB	NW-50B	2.00	16.00	6.90	8.15	4.65	1.6 Liter	
8.00	FTNA-8-150	-	1.50	16.75	9.00	9.00	5.50	4 Liter	
	FTNA-8-1502-NWB	NW-40B	1.50	16.90	9.00	9.15	5.65	4 Liter	
	FTNA-8-200	-	2.00	16.75	9.00	8.75	5.50	4 Liter	
	FTNA-8-2002-NWB	NW-50B	2.00	16.90	9.00	8.90	5.65	4 Liter	

Dimensions in inches

Prices subject to change without notice. - International product pricing will vary.

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Options (See page 2)

- ISO Body Flanges



DUAL TUBE LIQUID NITROGEN TRAPS



The dual-tube design allows the liquid nitrogen reservoir to be attached to an automatic fill tube, reducing the amount of service required by the system. These traps are available in in-line and right angle port configurations with 4.0, 6.0, and 8.0 inch OD bodies, .75 to 4.0 inch OD ports. The two-piece trap body and 304 stainless steel construction allow these traps to be easily cleaned. For proper sealing, apply a light coating of Krytox lube when cleaning or replacing the O-ring. ISO, CF or ASA flanges and electropolish finish available on request. Call for pricing.

In-Line Dual-Tube Liquid Nitrogen Traps

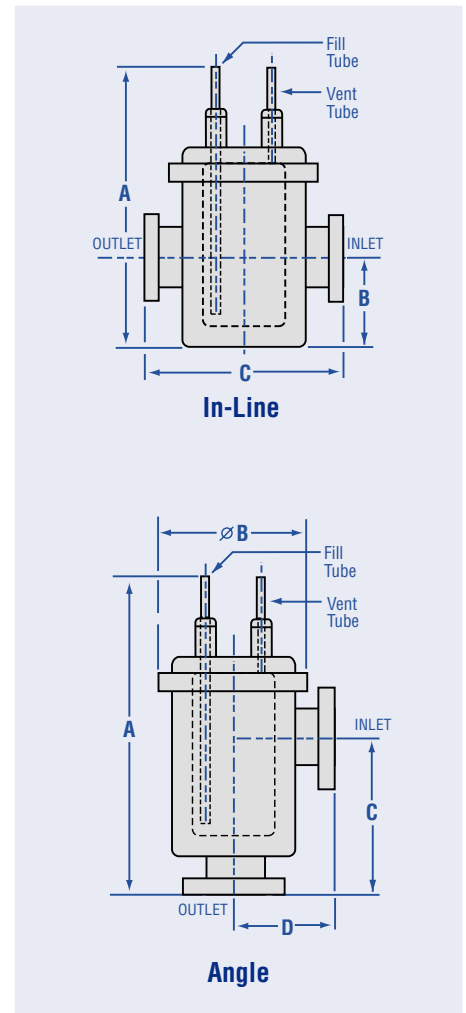
Body OD	Model Number	Flanges	Port OD	A	B	C	LN ₂ Reservoir	Price
4.00	NTD-4-075	-	.75	11.50	3.70	7.00	.75 Liter	
	NTD-4-0752-NWB	NW-16B	.75	11.50	3.70	7.30	.75 Liter	
	NTD-4-100	-	1.00	11.50	3.70	7.00	.75 Liter	
	NTD-4-1002-NWB	NW-25B	1.00	11.50	3.70	7.30	.75 Liter	
	NTD-4-150	-	1.50	11.50	3.70	7.00	.75 Liter	
	NTD-4-1502-NWB	NW-40B	1.50	11.50	3.70	7.30	.75 Liter	
6.00	NTD-6-150	-	1.50	14.20	4.50	9.00	1.6 Liter	
	NTD-6-1502-NWB	NW-40B	1.50	14.20	4.50	9.30	1.6 Liter	
	NTD-6-200	-	2.00	14.20	4.50	9.00	1.6 Liter	
	NTD-6-2002-NWB	NW-50B	2.00	14.20	4.50	9.30	1.6 Liter	
8.00	NTD-8-150	-	1.50	15.25	5.00	11.00	4 Liter	
	NTD-8-1502-NWB	NW-40B	1.50	15.25	5.00	11.30	4 Liter	
	NTD-8-200	-	2.00	15.25	5.00	11.00	4 Liter	
	NTD-8-2002-NWB	NW-50B	2.00	15.25	5.00	11.30	4 Liter	

Dimensions in inches

Angle Dual-Tube Liquid Nitrogen Traps

Body OD	Model Number	Flanges	Port OD	A	B	C	D	LN ₂ Reservoir	Price
4.00	NTDA-4-075	-	.75	13.00	4.80	7.03	3.50	.75 Liter	
	NTDA-4-0752-NWB	NW-16B	.75	13.15	4.80	7.18	3.65	.75 Liter	
	NTDA-4-100	-	1.00	13.00	4.80	6.91	3.50	.75 Liter	
	NTDA-4-1002-NWB	NW-25B	1.00	13.15	4.80	7.06	3.65	.75 Liter	
	NTDA-4-150	-	1.50	13.00	4.80	6.65	3.50	.75 Liter	
	NTDA-4-1502-NWB	NW-40B	1.50	13.15	4.80	6.80	3.65	.75 Liter	
6.00	NTDA-6-150	-	1.50	15.70	6.90	8.25	4.50	1.6 Liter	
	NTDA-6-1502-NWB	NW-40B	1.50	15.85	6.90	8.40	4.65	1.6 Liter	
	NTDA-6-200	-	2.00	15.70	6.90	8.00	4.50	1.6 Liter	
	NTDA-6-2002-NWB	NW-50B	2.00	15.85	6.90	8.15	4.65	1.6 Liter	
8.00	NTDA-8-150	-	1.50	16.75	9.00	9.00	5.50	4 Liter	
	NTDA-8-1502-NWB	NW-40B	1.50	16.90	9.00	9.15	5.65	4 Liter	
	NTDA-8-200	-	2.00	16.75	9.00	8.75	5.50	4 Liter	
	NTDA-8-2002-NWB	NW-50B	2.00	16.90	9.00	8.90	5.65	4 Liter	

Dimensions in inches



Options (See page 2)

- ISO Body Flanges

Prices subject to change without notice. - International product pricing will vary.

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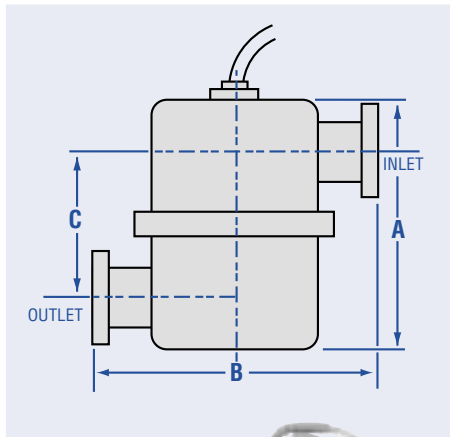
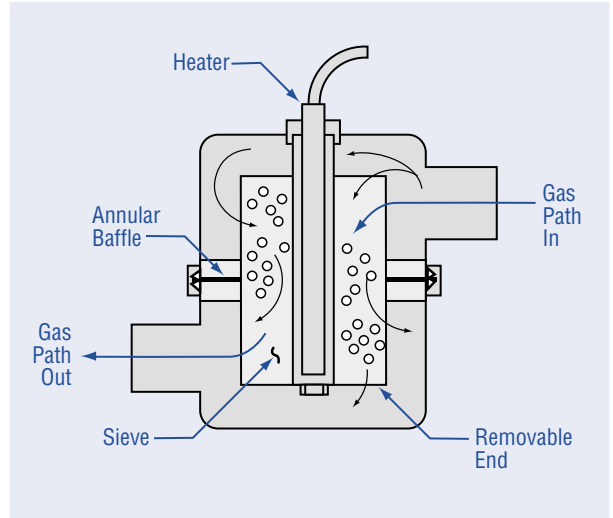


These traps perform a dual function. A zeolite desiccant removes hydrocarbons which backstream toward the chamber when the mechanical pump oil is at its vapor pressure. Also, the zeolite traps water vapor and other gasses before they reach the mechanical pump and contaminate the pump oil. Depending on the process this can reduce the frequency of oil changes by a significant amount.

Nor-Cal's molecular sieve foreline trap utilizes the flex trap design for ease of maintenance and zeolite replacement. For maximum conductance the sieve material is contained in a suspended basket fabricated from perforated 304 stainless steel. The suspended basket provides the conductance to the sieve at the top of the basket as well as around the periphery. A mid-basket baffle causes the gas to enter one-half of the basket and to exit the other half.

When initializing a new trap, replacing the sieve or when base pressure cannot be achieved, the sieve should be regenerated by turning on the heater for a few hours and running the mechanical pump with its ballast valve open. The frequency and duration of sieve regeneration is dependent upon the kind and amount of gasses produced by the particular application. To replace the sieve, remove the trap end that contains the heater and remove the nut at the end of the basket. Dump the expired sieve material, replace with new, reattach the basket/end plate then perform the regeneration process outlined in the previous paragraph.

All molecular sieve traps are supplied with a molecular sieve charge and a regeneration heater. The heater is held in place with a clip allowing these traps to be mounted in any position. A 4.0 inch diameter trap heater is rated at 120V, 125W; 6.0 inch at 120V, 230W; and 8.0 inch at 120V, 350W. A 240 volt regeneration heater is available as an option. Other voltages and wattages are available upon request. Standard trap finish is beadblasted. Electropolish finish, custom flange configurations, and larger body sizes are also available. Call for pricing.



In-Line Molecular Sieve Traps

Body OD	Model Number	Flanges	Port OD	A	B	C	Price
4.00	FTM-4-075	-	.75	6.20	7.00	3.50	
	FTM-4-0752-NWB	NW-16B	.75	6.20	7.30	3.50	
	FTM-4-100	-	1.00	6.20	7.00	3.50	
	FTM-4-1002-NWB	NW-25B	1.00	6.20	7.30	3.50	
	FTM-4-150	-	1.50	6.20	7.00	3.50	
	FTM-4-1502-NWB	NW-40B	1.50	6.20	7.30	3.50	
6.00	FTM-6-150	-	1.50	8.10	9.00	4.00	
	FTM-6-1502-NWB	NW-40B	1.50	8.10	9.30	4.00	
	FTM-6-200	-	2.00	8.10	9.00	4.00	
	FTM-6-2002-NWB	NW-50B	2.00	8.10	9.30	4.00	
8.00	FTM-8-200	-	2.00	13.00	11.00	6.75	
	FTM-8-2002-NWB	NW-50B	2.00	13.00	11.30	6.75	
	FTM-8-250	-	2.50	13.00	11.00	6.75	
	FTM-8-2502-ISO	ISO-63-250-OF	2.50	13.00	11.50	6.75	
	FTM-8-300	-	3.00	13.00	11.00	6.75	
	FTM-8-3002-ISO	ISO-80-300-OF	3.00	13.00	11.50	6.75	
	FTM-8-400	-	4.00	13.00	11.00	6.75	
	FTM-8-4002-ISO	ISO-100-400-OF	4.00	13.00	11.50	6.75	

Dimensions in inches

Replacement Sieves

Body OD	Model Number	Description	Price
4.00	FT-4-MS	1 lb. Molecular Sieve Charge, 4 trap requires .75 lb.	
6.00	FT-6-MS	2 lb. Molecular Sieve Charge, 6" trap requires 1.5 lb.	
8.00	FT-8-MS	5 lb. Molecular Sieve Charge, 8" trap requires 4.75 lb.	

Other replacement hardware located on page 17

Dimensions in inches

Prices subject to change without notice. - International product pricing will vary.

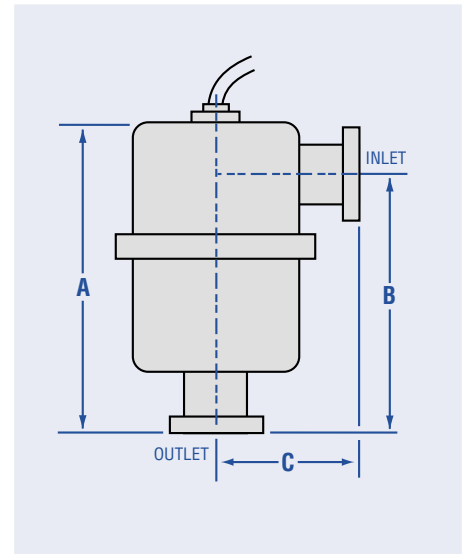
TRAPA-LIT 7/02



Angle Molecular Sieve Traps

Body OD	Model Number	Flanges	Port OD	A	B	C	Price
4.00	FTMA-4-075	-	.75	7.70	6.40	3.50	
	FTMA-4-0752-NWB	NW-16B	.75	7.70	6.55	3.65	
	FTMA-4-100	-	1.00	7.70	6.40	3.50	
	FTMA-4-1002-NWB	NW-25B	1.00	7.70	6.55	3.65	
	FTMA-4-150	-	1.50	7.70	6.40	3.50	
	FTMA-4-1502-NWB	NW-40B	1.50	7.70	6.55	3.65	
6.00	FTMA-6-150	-	1.50	9.60	7.60	4.50	
	FTMA-6-1502-NWB	NW-40B	1.50	9.60	7.75	4.65	
	FTMA-6-200	-	2.00	9.60	7.60	4.50	
	FTMA-6-2002-NWB	NW-50B	2.00	9.60	7.75	4.65	
8.00	FTMA-8-200	-	2.00	14.50	11.38	5.50	
	FTMA-8-2002-NWB	NW-50B	2.00	14.65	11.53	5.65	
	FTMA-8-250	-	2.50	14.50	11.38	5.50	
	FTMA-8-2502-ISO	ISO-63-250-OF	2.50	14.75	11.63	5.75	
	FTMA-8-300	-	3.00	14.50	11.38	5.50	
	FTMA-8-3002-ISO	ISO-80-300-OF	3.00	14.75	11.63	5.75	
	FTMA-8-400	-	4.00	14.50	11.38	5.50	
	FTMA-8-4002-ISO	ISO-100-400-OF	4.00	14.75	11.63	5.75	

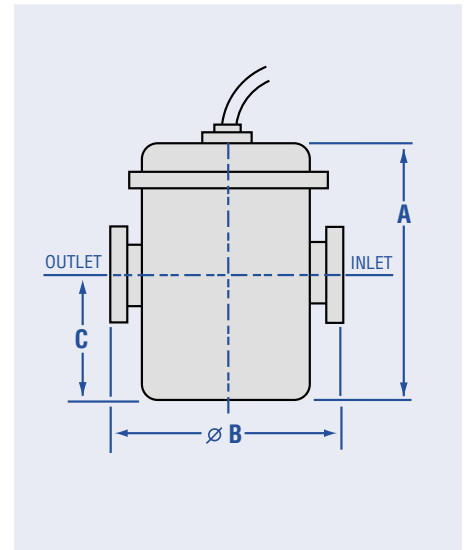
Dimensions in inches



Straight-In-Line Molecular Sieve Traps

Body OD	Model Number	Flanges	Port OD	A	B	C	Price
4.00	FTMS-4-075	-	.75	7.00	7.00	3.50	
	FTMS-4-0752-NWB	NW-16B	.75	7.00	7.30	3.50	
	FTMS-4-100	-	1.00	7.00	7.00	3.50	
	FTMS-4-1002-NWB	NW-25B	1.00	7.00	7.30	3.50	
	FTMS-4-150	-	1.50	7.00	7.00	3.50	
	FTMS-4-1502-NWB	NW-40B	1.50	7.00	7.30	3.50	
6.00	FTMS-6-150	-	1.50	7.00	9.00	3.50	
	FTMS-6-1502-NWB	NW-40B	1.50	7.00	9.30	3.50	
	FTMS-6-200	-	2.00	7.00	9.00	3.50	
	FTMS-6-2002-NWB	NW-50B	2.00	7.00	9.30	3.50	
8.00	FTMS-8-200	-	2.00	10.00	11.00	5.00	
	FTMS-8-2002-NWB	NW-50B	2.00	10.00	11.30	5.00	
	FTMS-8-250	-	2.50	10.00	11.00	5.00	
	FTMS-8-2502-ISO	ISO-63-250-OF	2.50	10.00	11.50	5.00	
	FTMS-8-300	-	3.00	10.00	11.00	5.00	
	FTMS-8-3002-ISO	ISO-80-300-OF	3.00	10.00	11.50	5.00	
	FTMS-8-400	-	4.00	10.00	11.00	5.00	
	FTMS-8-4002-ISO	ISO-100-400-OF	4.00	10.00	11.50	5.00	

Dimensions in inches



Options (See page 2)

- 240V Regeneration Heaters
- ISO Body Flanges

Replacement Heaters

Trap OD	Model Number	Description	Price
4.00	FT-4-HR	Molecular Sieve Cartridge Heater, rated at 120V, 125W	
4.00	FT-4-HR-240V	Molecular Sieve Cartridge Heater, rated at 240V, 125W	
6.00	FT-6-HR	Molecular Sieve Cartridge Heater, rated at 120V, 230W	
6.00	FT-6-HR-240V	Molecular Sieve Cartridge Heater, rated at 240V, 125W	
8.00	FT-8-HR	Molecular Sieve Cartridge Heater, rated at 120V, 350W	
8.00	FT-8-HR-240V	Molecular Sieve Cartridge Heater, rated at 240V, 350W	

Other replacement hardware located on Page 17

Dimensions in inches

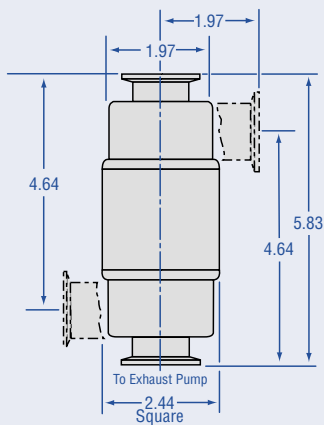
Larger port sizes and custom flange configurations available on request.

Prices subject to change without notice. - International product pricing will vary.

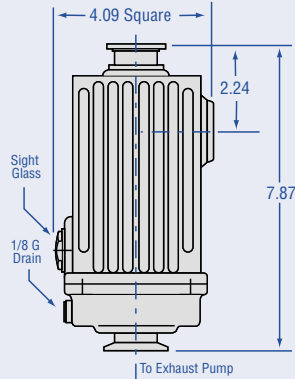
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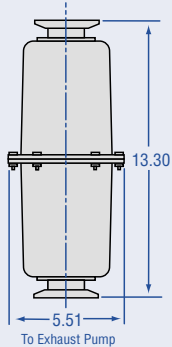
FTOME-25-S



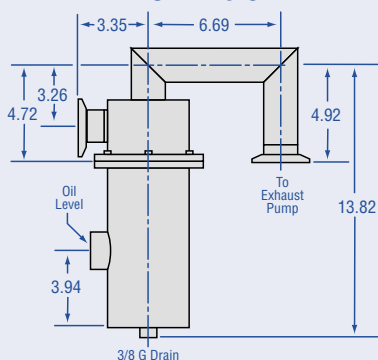
FTOME-25-HP



FTOME-40-S



FTOME-40-C2



FTOME-25-S



FTOME-25-HP

During rotary vane pump operation, oil mist escapes from the exhaust port; mainly when pumping between atmospheric pressure and 1 mbar. Safe operation of a rotary vane pump requires an Oil Mist Eliminator (OME) to be mounted above the pump's exhaust port. The oil mist is present in exhaust gases with a high level of separation. These mists present a potential environmental and health hazard as well as creating an oily build-up on everything in the pump's proximity. Misting increases as exhaust pressure increases.

The OME's filtration system contains the mist* and returns it to the pump body. The OME's internal over-pressure valve prevents vapor explosions due to exceeding the maximum permissible exhaust pressure.

**Oil mist eliminators do not trap gas. Vent all processes properly.*

Oil Mist Eliminators

Model Number	Process Usage	Body	Flanges	Price
FTOME-25-S	General, non-corrosive	Polyamide	NW-25	
FTOME-25-HP	General, non-corrosive. For frequent cycling or high pressure operation	Aluminum	NW-25	
FTOME-40-S	General, non-corrosive	Aluminum	NW-40	
FTOME-40-C2	Fluorinated, corrosive	Stainless Steel	NW-40	

Replacement Filters

Model Number	Use with	Filter Material	Quantity	Price
FTOME-25-S-F	FTOME-25-S	Epoxy/glass microfiber	1	
FTOME-25-HP-F	FTOME-25-HP	Epoxy/glass microfiber	1	
FTOME-40-S-F	FTOME-40-S	Epoxy/glass microfiber	1	
FTOME-40-C2-F	FTOME-40-C2	Polypropylene	1	

For NW clamps, O-rings and aluminum or stainless steel centering rings please refer to the Nor-Cal Products NW-ISO catalog.

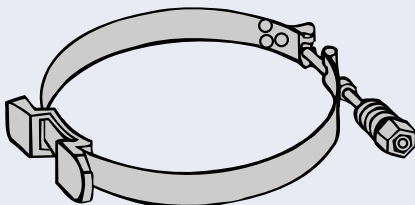


Foreline Trap Replacement Hardware

Body OD	Model Number	For Use With Trap Type	Description	Price
All	FT-CP-B FTW-QD	All Types (except 2.00 bodies) All Water Cooled	Replacement T-Bolt and Nuts for Trap Mounting Bracket Quick Disconnect Fittings Kit for Water Cooled Traps (DESO)	
2.00	FT-2-SS FT-2-CS NW-50-OR-V NW-50-CP	Metal Sieve Metal Sieve All Types All Types	Stainless Steel Sieve Cartridge Copper Sieve Cartridge Viton® Body O-Ring Body Clamp	
4.00	FT-4-SS FT-4-CS FT-4-MS FT-4-HR FT-4-HR-240V FT-4-OR FT-4-CP FT-4-MB	Metal Sieve Metal Sieve Molecular Sieve Molecular Sieve Molecular Sieve All Types All Types All Types	Stainless Steel Sieve Cartridge Copper Sieve Cartridge 1 lb. Molecular Sieve Charge, requires .75 lb. Molecular Sieve Molecular Sieve Cartridge Heater, rated at 120V, 125W Molecular Sieve Cartridge Heater, rated at 240V, 125W Viton® Body O-Ring Body Clamp Trap Mounting Bracket	
4.50	FT-4.5-OR FT-4.5-CP FT-4.5-MB FTW-4.5-OR	All Types All Types All Types Water Cooled	Viton® Body O-Ring Body Clamp Trap Mounting Bracket Internal Viton® O-Ring	
6.00	FT-6-SS FT-6-CS FT-6-MS FT-6-HR FT-6-HR-240V FT-6-OR FT-6-CP FT-6-MB FT-6-PP FT-6-PF FT-6-PF-L7	Metal Sieve Metal Sieve Molecular Sieve Molecular Sieve Molecular Sieve All Types All Types All Types Particulate Particulate Particulate	Stainless Steel Sieve Cartridge Copper Sieve Cartridge 2 lb. Molecular Sieve Charge Molecular Sieve Cartridge Heater, rated at 120V, 230W Molecular Sieve Cartridge Heater, rated at 240V, 125W Viton® Body O-Ring Body Clamp Trap Mounting Bracket 11.5" Standard Length Polyester Felt Filter 11.5" Standard Length Woven Fiberglass Filter 7.5" Length High Capacity Woven Fiberglass Filter	
8.00	FT-6-PP FT-6-PF FT-8-SS FT-8-SS-5 FT-8-PF-5 FT-8-CS FT-8-MS FT-8-HR FT-8-HR-240V FT-8-OR FT-8-CP FT-8-MB	Particulate Particulate Metal Sieve and One Stage LPCVD/TEOS Two and Three Stage LPCVD/TEOS Two and Three Stage LPCVD/TEOS Metal Sieve Molecular Sieve Molecular Sieve Molecular Sieve All Types All Types All Types	8" Standard Length Polyester Particulate Filter 8" Standard Length Woven Fiberglass Particulate Filter 8" Standard Length Stainless Steel Sieve Cartridge 5" Length Stainless Steel Sieve Cartridge 5" Length Woven Fiberglass Particulate Trap Filter Copper Sieve Cartridge 5 lb. Molecular Sieve Charge Molecular Sieve Cartridge Heater, rated at 120V, 350W Molecular Sieve Cartridge Heater, rated at 240V, 125W Viton® Body O-Ring Body Clamp Trap Mounting Bracket	

Dimensions in inches

TRAP MOUNTING BRACKET



Prices subject to change without notice. - International product pricing will vary.

TRAPA-LIT 7/02