

Torrento® S Series Filters

High-performance 10 nm filters enabling breakthrough particle protection and superior cleanliness in advanced, critical solvent-based applications

Torrento® S series 10 nm filters are specially designed for solvent and solvent-blend applications in 14 – 20 nm device nodes. Available in both cartridge and disposable formats, Torrento S series filters utilize an advanced, nondewetting PTFE media that is targeted at aggressive solvents, such as ketones, alcohols, IPA, acetates, and N-Butyl Alcohol (NBA), as well as BEOL strip chemistries containing high levels of solvents.

Entegris' ultra clean membrane (UCM) technology, a standard feature with Torrento S series filters, removes the most challenging contaminants in advanced processes. The enhanced UCM-16 cleaning technology ensures lower organic extractables with high retention, fast start up time, and flow rate performance similar to Torrento X series filters.

APPLICATIONS

- Sub-24 nm device nodes for 300 mm and 450 mm tools
- Aggressive solvents, such as ketones, alcohols, IPA, acetates, and NBA
- BEOL strip chemistries containing high levels of solvents
- Single wafer and batch tools for advanced nodes
- Critical chemical manufacturing and delivery systems
- Solvent and solvent/aqueous blend optimized processes
- Point-of-use (POU) and chemical delivery systems (CDS)



FEATURES & BENEFITS

Advanced PTFE media	Improves flow rate with ATF membrane design
	10 nm retention rating optimized for high solvent chemistry applications at 14 – 20 nm device nodes
	Maintains wettability and excellent retention performance with a wide range of chemistries
Enhanced UCM-16 cleaning technology	Ensures lower organic extractables with similar retention and flow rate performance of Torrento X series filters
	Removes the most challenging contaminants for proven particle protection and ultra cleanliness
Solvent-based chemical compatibility	Recommended for ambient and elevated temperatures with aggressive solvents including NBA, IPA, cyclohexanone, OK73, PGMEA, PGME, and advanced BEOL strip chemistries containing high levels of solvents

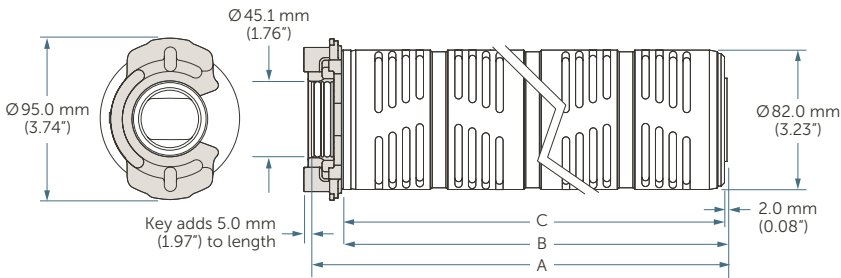
SPECIFICATIONS

		TORRENTO S SERIES 10 NM ATE/AT3/ATF CARTRIDGES	TORRENTO S SERIES 10 NM ATE/AT3/ATF CHEM-LINE I AND II	TORRENTO S SERIES 10 NM SMALL DISPOSABLES 1500/3000
Materials	Membrane	Prewet, nondewetting PTFE		
	Supports	PFA		
	Cartridge O-ring options	E-FKM, E-ETP, Kalrez® (6375UP)	—	—
	Shell	PFA		
Retention rating		10 nm		
Membrane area		ATE 10": 2 m² (21 ft²) ATF 10": 2.4 m² (25.8 ft²)		1500 type: 0.19 m² (2.05 ft²) 3000 type: 0.44 m² (4.74 ft²)
		AT3 10": 3 m² (32 ft²) ATF 20" Cartridges: 4.8 m² (51.7 ft²) ATF 20" Disposable: N/A		
Cartridge connections		Code 0 (2-222) O-rings		—
Maximum operating conditions	Maximum operating pressure	0.58 MPa (5.8 bar; 84 psi) @ 25°C (77°F)		0.59 MPa (5.9 bar; 86 psi) @ 25°C (77°F)
		0.097 MPa (0.97 bar; 14 psi) @ 200°C (392°F)		0.19 MPa (1.9 bar; 28 psi) @ 95°C (203°F)
	Maximum forward differential pressure	0.44 MPa (4.4 bar; 64 psi) @ 25°C (77°F)		0.39 MPa (3.9 bar; 57 psi) @ 25°C (77°F)
		0.05 MPa (0.52 bar; 7.5 psi) @ 200°C (392°F)		0.19 MPa (1.9 bar; 28 psi) @ 95°C (203°F)
	Maximum reverse pressure	0.34 MPa (3.45 bar; 50 psi) @ 25°C (77°F)		0.29 MPa (2.9 bar; 42 psi) @ 25°C (77°F)
	Maximum operating temperature	200°C (392°F)		95°C (203°F)
Metallic extractables	UCM-16 clean	Testing conducted for 16 metals		—
Other extractables (prewet only)	UCM-16 clean	TOC, CI NVR		—

Notes: For solvents, select the "Dry" option; and for aqueous-solvent blends, select the "Prewet" option. All Torrento S-series 10 nm product configurations are PFOA free.

Toronto S Series Cartridge Filters (AT3, ATE, and ATF)

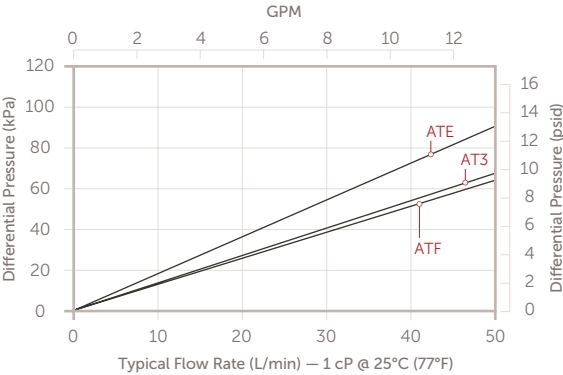
DIMENSIONS



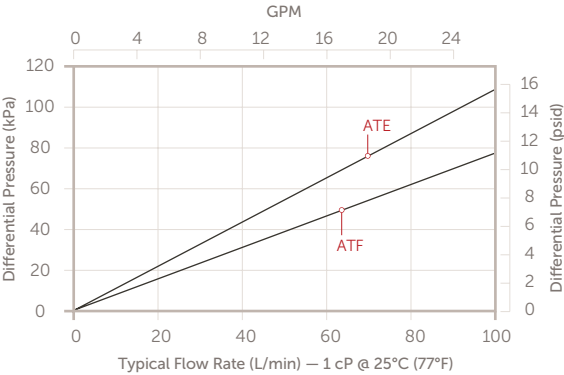
Length	A (Overall)	B (Control)	C (Shoulder)
10"	244.0 mm (9.61")	227.0 mm (8.94")	225.0 mm (8.86")
20"	471.0 mm (18.54")	454.0 mm (17.87")	452.0 mm (17.80")
30"	699.5 mm (27.54")	682.0 mm (26.85")	681.0 mm (26.81")

PERFORMANCE DATA

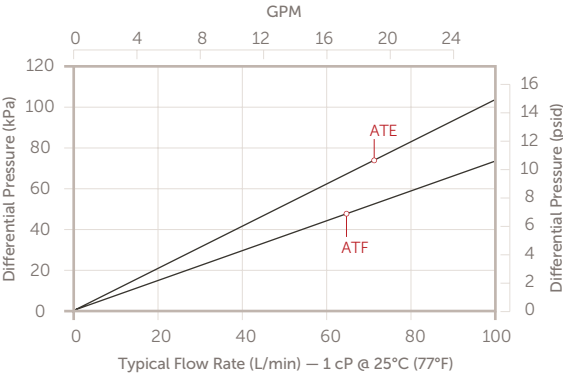
Toronto S Series 10 nm
10" Cartridges



Toronto S Series 10 nm
30" Cartridges



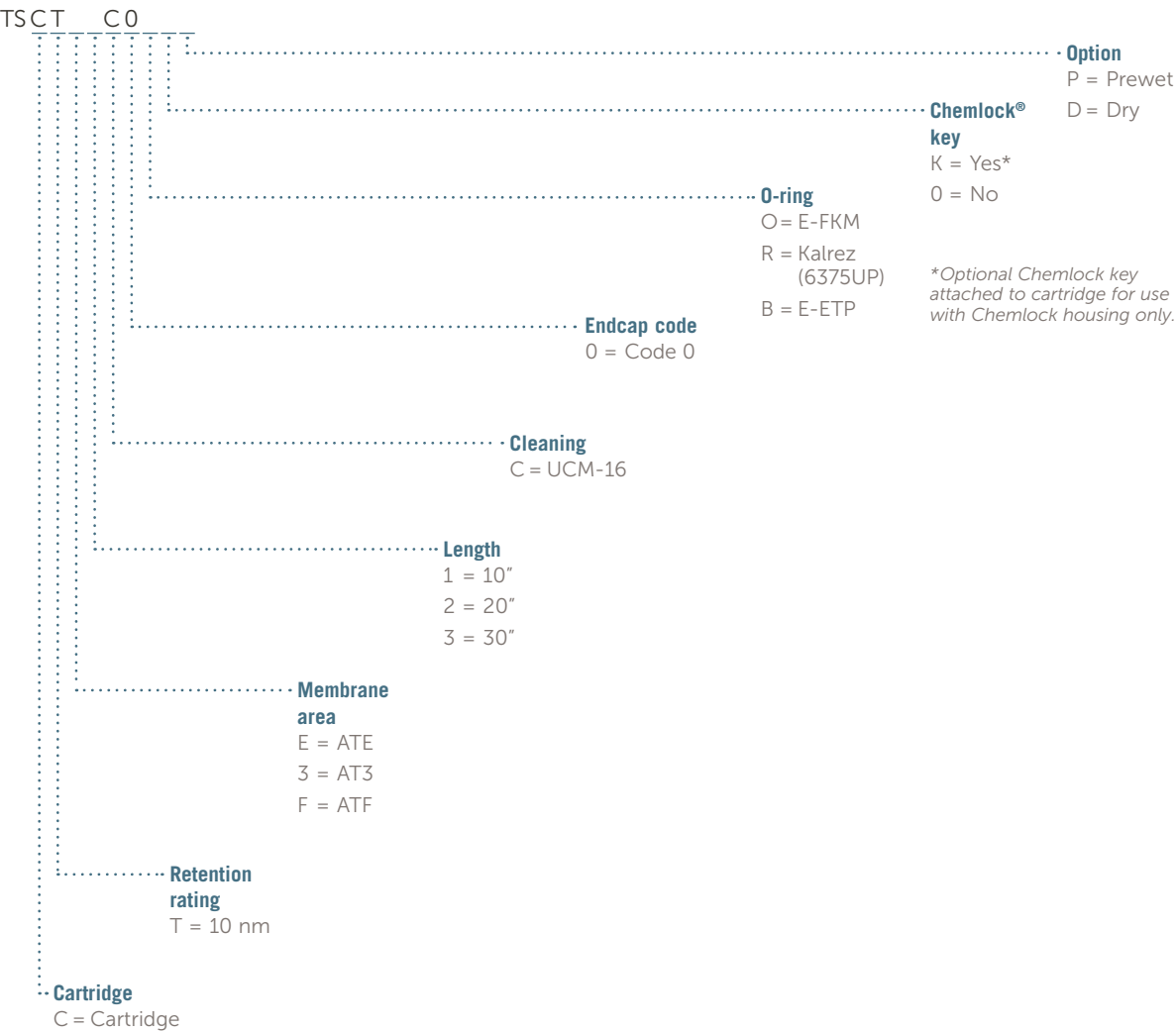
Toronto S Series 10 nm
20" Cartridges



ORDERING INFORMATION

This information serves as a guide. Please contact your local representative to confirm part numbers.

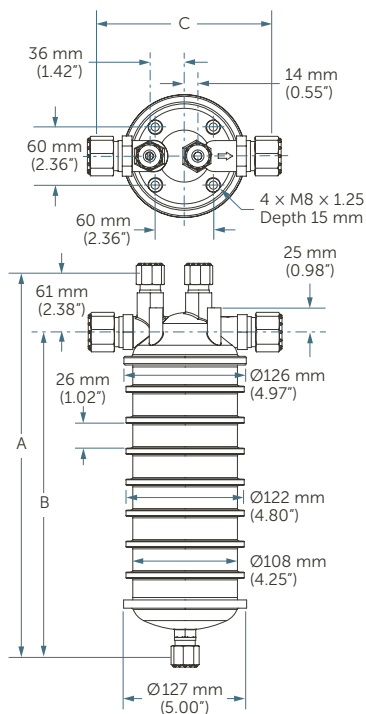
Torrento S Series Cartridge Filters: part number



Toronto S Series Chem-Line™ I and Chem-Line II Disposable Filters

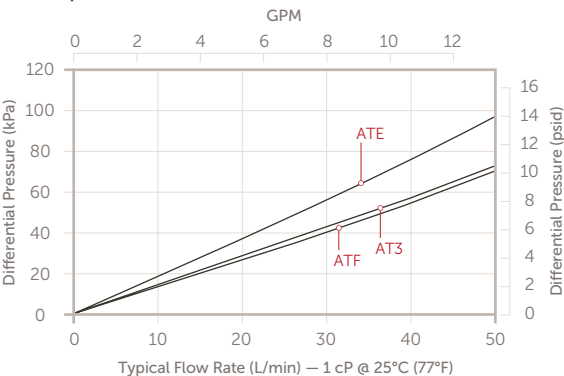
DIMENSIONS

Chem-Line I T-line with Standard Vent
T02H

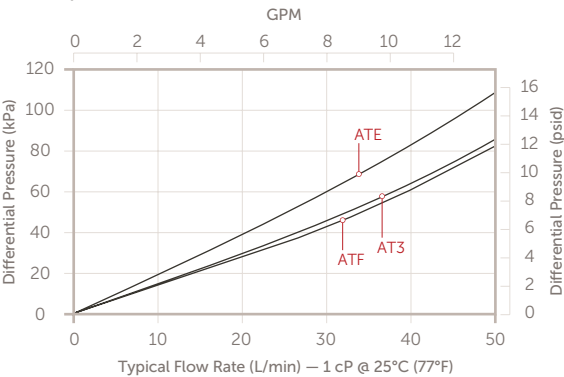


PERFORMANCE DATA

Toronto S Series 10 nm 1" I/O
10" Disposables



Toronto S Series 10 nm ¾" I/O
10" Disposables



Nominal dimensions for Chem-Line I with standard vent – T-Line

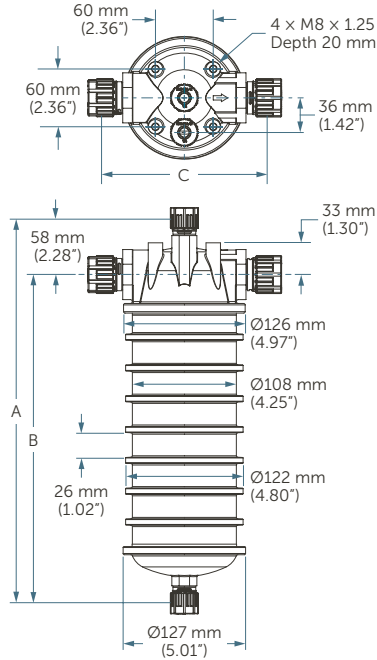
Disposable type	Configuration	A (Overall height)	B (Height: bottom fitting to centerline inlet fitting)	C (Inlet to outlet)
T02H ¾" inlet/outlet, ½" vent/drain, Super Type Pillar® fittings	ATE/AT3/ATF 10"	396 mm (15.58")	335 mm (13.19")	180 mm (7.09")

DIMENSIONS (CONTINUED)

Chem-Line I Disposable Filters with Rotated Vent

This drawing represents the Chem-Line I disposable filters with rotated vent. Refer to the accompanying table for specific dimensional information.

Chem-Line I T-line with Rotated Vent 902S, 942S



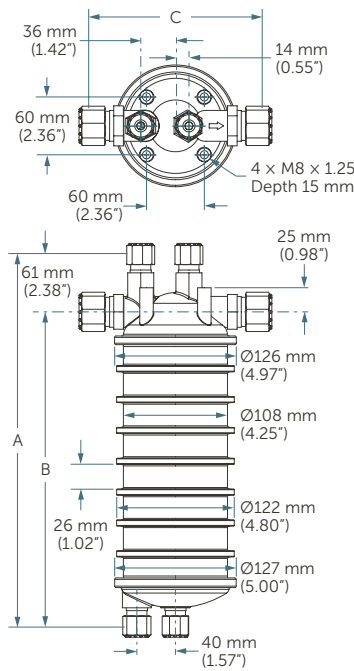
Nominal dimensions for Chem-Line I with rotated Vent – T-Line

Disposable type	Configuration	A (Overall height)	B (Height: bottom fitting to centerline inlet fitting)	C (Inlet to outlet)
902S: ¾" inlet/outlet, ½" vent/drain, Super 300 Type Pillar fittings	ATE/AT3/ATF 10"	399 mm (15.70")	341 mm (13.43")	172 mm (6.77")
942S: 1" inlet/outlet, ½" vent/drain, Super 300 Type Pillar fittings	ATE/AT3/ATF 10"	399 mm (15.70")	341 mm (13.43")	182 mm (7.17")

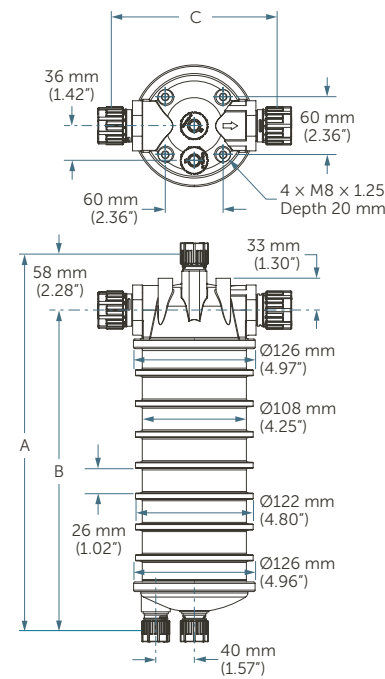
DIMENSIONS (CONTINUED)

Chem-Line I Disposable Filters with Core Vent and Core Vent (Rotated)

Chem-Line I T-line with Core Vent T02H



Chem-Line I T-line with Core Vent (Rotated) 902S, 942S, 902L, 942L



Disposable type	Configuration	A (Overall height)	B (Height: bottom fitting to centerline inlet fitting)	C (Inlet to outlet)
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Nominal dimensions for Chem-Line I with core vent – T-Line

T02H: <i>3/4" inlet/outlet, 1/2" vent/drain, Super Type Pillar fittings</i>	ATE/AT3/ATF 10"	388 mm (15.26")	327 mm (12.87")	180 mm (7.09")
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Nominal dimensions for Chem-Line I core vent (rotated) – T-Line

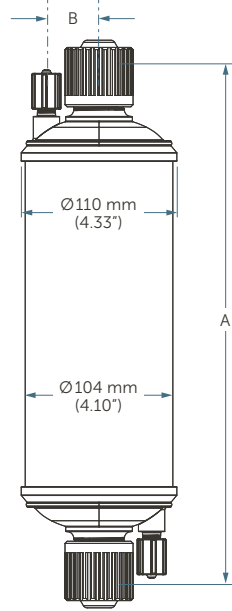
902S: <i>3/4" inlet/outlet, 1/2" vent/drain, Super 300 Type Pillar fittings</i>	ATE/AT3/ATF 10"	391 mm (15.37")	333 mm (13.11")	172 mm (6.77")
942S: <i>1" inlet/outlet, 1/2" vent/drain, Super 300 Type Pillar fittings</i>	ATE/AT3/ATF 10"	391 mm (15.37")	333 mm (13.11")	182 mm (7.17")
902L: <i>3/4" inlet/outlet, 1/2" vent/drain, PrimeLock® fittings</i>	ATE/AT3/ATF 10"	421 mm (16.58")	346 mm (13.62")	215 mm (8.48")
942L: <i>1" inlet/outlet, 1/2" vent/drain, PrimeLock fittings</i>	ATE/AT3/ATF 10"	421 mm (16.58")	346 mm (13.62")	243 mm (9.58")

DIMENSIONS (CONTINUED)

Chem-Line II Disposable Filters

This drawing represents the Chem-Line II disposable filters. Refer to the accompanying tables for additional information. The first table cross-references the inlet/outlet (I/O) sizes with each fitting type, and the second table provides specific dimensional information.

Chem-Line II Flaretek®, Super 300 Type Pillar, PrimeLock



Inlet/outlet (I/O) sizes for Chem-Line II fitting types

Fitting type	Vent/ drain	Inlet/outlet			
		3/8"	1/2"	3/4"	1"
Flaretek	1/4"	X	X	X	X
Flaretek (offset)	1/2"	—	—	X	X
Super 300 Type Pillar	1/4"	—	X	X	X
Super 300 Type Pillar (offset)	1/2"	—	—	X	X
Super 300 Type Pillar (female)	1/4"	—	—	X	—
PrimeLock	1/4"	X	X	X	—
PrimeLock (offset)	1/4"	—	—	—	X

Nominal dimensions for Chem-Line II

Fitting type		FLARETEK FITTINGS		SUPER 300 TYPE PILLAR FITTINGS (FEMALE)		SUPER 300 TYPE PILLAR FITTINGS (MALE)		PRIMELOCK FITTINGS	
		B	A	B	A	B	A	B	A
INLET/OUTLET	VENT/ DRAIN	10"		10"		10"		10"	
3/8"	1/4"	37 mm (1.46")	343 mm (13.51")	—	—	—	—	37 mm (1.46")	356 mm (14.02")
1/2"	1/4"	37 mm (1.46")	356 mm (14.03")	—	—	37 mm (1.46")	341 mm (13.41")	37 mm (1.46")	361 mm (14.20")
3/4"	1/4"	37 mm (1.46")	359 mm (14.13")	37 mm (1.46")	358 mm (14.09")	37 mm (1.46")	350 mm (13.76")	37 mm (1.46")	373 mm (14.68")
3/4"	1/2"	41 mm (1.63")	363 mm (14.30")	—	—	41 mm (1.63")	349 mm (13.74")	—	—
1"	1/4"	37 mm (1.46")	368 mm (14.47")	—	—	37 mm (1.46")	383 mm (15.07")	41 mm (1.63")	384 mm (15.12")
1"	1/2"	41 mm (1.63")	376 mm (14.82")	—	—	41 mm (1.63")	380 mm (14.97")	—	—

A = Overall height B = Centerline fitting length

ORDERING INFORMATION

This information serves as a guide. Please contact your local representative to confirm part numbers.

Torrento S Series Chem-Line I Disposable Filters Standard Vent: part number

TSDT 1C				Option
Type	Retention rating	Membrane area	Cleaning	P = Prewet D = Dry
D = Chem-Line I Disposable Standard Vent	T = 10 nm	E = ATE 3 = AT3 F = ATF	C = UCM-16	
			Length	Fitting configuration
			1 = 10"	T02H = T-line, 3/4" inlet/outlet, 1/2" vent/drain, Super Type Pillar
				902S = T-line, rotated vent, 3/4" inlet/outlet, 1/2" vent/drain, Super 300 Type Pillar
				942S = T-line, rotated vent, 1" inlet/outlet, 1/2" vent/drain, Super 300 Type Pillar

Torrento S Series Chem-Line I Disposable Filters Core Vent: part number

TSVT 1C				Option
Type	Retention rating	Membrane area	Cleaning	P = Prewet D = Dry
V = Chem-Line I Disposable Core Vent	T = 10 nm	E = ATE 3 = AT3 F = ATF	C = UCM-16	
			Length	Fitting configuration
			1 = 10"	T02H = T-line, 3/4" inlet/outlet, 1/2" vent/drain, Super Type Pillar
				902S = T-line, rotated vent, 3/4" inlet/outlet, 1/2" vent/drain, Super 300 Type Pillar
				942S = T-line, rotated vent, 1" inlet/outlet, 1/2" vent/drain, Super 300 Type Pillar
				902L = T-line, rotated vent, 3/4" inlet/outlet, 1/2" vent/drain, PrimeLock
				942L = T-line, rotated vent, 1" inlet/outlet, 1/2" vent/drain, PrimeLock

Torrento S Series Chem-Line II Disposable Filters: part number

TS2T 1C				Option
Type	Retention rating	Membrane area	Cleaning	P = Prewet D = Dry
2 = Chem-Line II Disposable	T = 10 nm	E = ATE 3 = AT3 F = ATF	C = UCM-16	
			Length	Fitting configuration
			1 = 10"	M41F = In-line male, 1" inlet/outlet, 1/4" vent/drain, Flaretek
				M01F = In-line male, 3/4" inlet/outlet, 1/4" vent/drain, Flaretek
				M21F = In-line male, 1/2" inlet/outlet, 1/4" vent/drain, Flaretek
				M31F = In-line male, 3/8" inlet/outlet, 1/4" vent/drain, Flaretek
				142F = In-line male offset, 1" inlet/outlet, 1/2" vent/drain, Flaretek
				102F = In-line male offset, 3/4" inlet/outlet, 1/2" vent/drain, Flaretek
				M41S = In-line male, 1" inlet/outlet, 1/4" vent/drain, Super 300 Type Pillar
				M01S = In-line male, 3/4" inlet/outlet, 1/4" vent/drain, Super 300 Type Pillar
				M21S = In-line male, 1/2" inlet/outlet, 1/4" vent/drain, Super 300 Type Pillar
				142S = In-line male offset, 1" inlet/outlet, 1/2" vent/drain, Super 300 Type Pillar
				102S = In-line male offset, 3/4" inlet/outlet, 1/2" vent/drain, Super 300 Type Pillar
				F01S = In-line female, 3/4" inlet/outlet, 1/4" vent/drain, Super 300 Type Pillar
				141L = In-line male offset, 1" inlet/outlet, 1/4" vent/drain, PrimeLock
				M01L = In-line male, 3/4" inlet/outlet, 1/4" vent/drain, PrimeLock
				M21L = In-line male, 1/2" inlet/outlet, 1/4" vent/drain, PrimeLock
				M31L = In-line male, 3/8" inlet/outlet, 1/4" vent/drain, PrimeLock

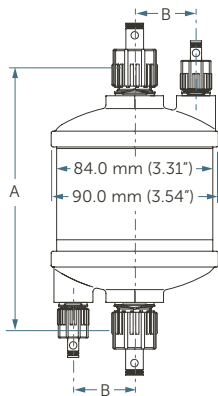
Toronto S Series 1500/3000 Type Disposable Filters

DIMENSIONS

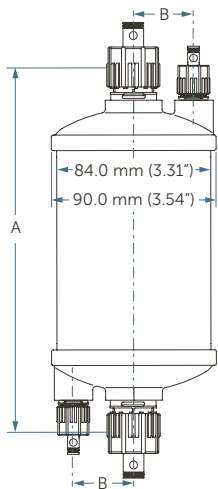
Small Disposable Filters 1500/3000

These drawings represent the small disposable filters (1500 and 3000). Refer to the accompanying tables for specific dimensional information.

1500 Disposable Super 300 Type Pillar



3000 Disposable Super 300 Type Pillar



Nominal dimensions – small disposables 1500

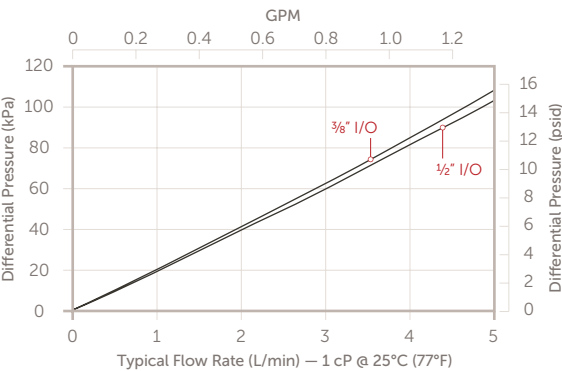
Fitting types	DIMENSION	
	A	B
8 mm Super 300 Type Pillar	135 mm (5.32")	31 mm (1.22")
3/8" Super 300 Type Pillar	141 mm (5.55")	31 mm (1.22")

Nominal dimensions – small disposables 3000

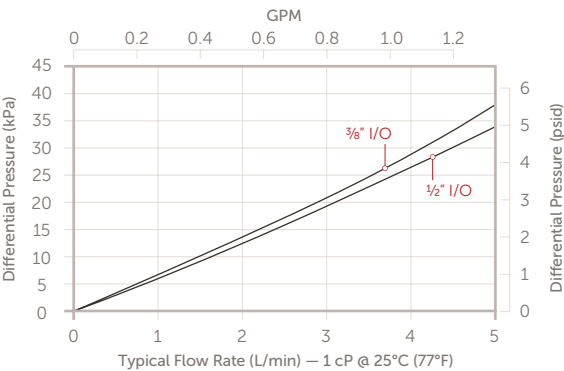
Fitting types	DIMENSION	
	A	B
1/2" Super Type Pillar	204 mm (8.03")	32 mm (1.26")
8 mm Super 300 Type Pillar	189 mm (7.44")	31 mm (1.22")
3/8" Super 300 Type Pillar	194 mm (7.64")	31 mm (1.22")
1/2" Super 300 Type Pillar	199 mm (7.84")	31 mm (1.22")

PERFORMANCE DATA

Toronto S Series 10 nm – 1500 Type Disposables



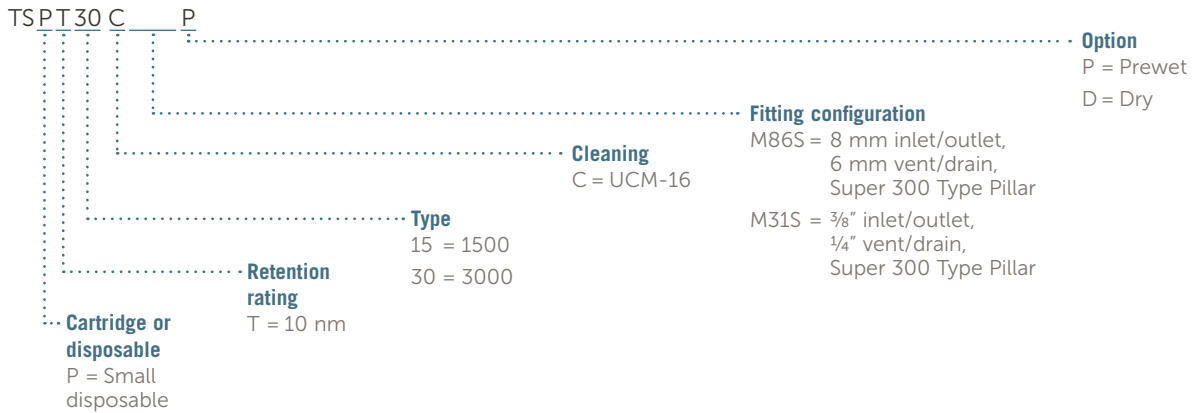
Toronto S Series 10 nm – 3000 Type Disposables



ORDERING INFORMATION

This information serves as a guide. Please contact your local representative to confirm part numbers.
Not all part number configurations are available at this time.

Torrento S Series Small Disposable 1500/3000 Filters: part number



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