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Advanced Energy Saving Compressed Air Filters

300 Series

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Sustainable Filtration Solutions

Energy costs continue to escalate globally, having a negative impact on plant profitability and production costs. Sustainability initiatives in plant operations must be implemented to maintain a competitive advantage.

Air treatment manufacturers are challenged to design equipment that is cost effective, delivers optimum performance and consumes less energy. The Deltech 300 Filter Series is the ideal solution to remove contamination from compressed air systems and save energy. The 300 Series employs technological advancements in filtration materials and design to ensure premium compressed air quality and low operational costs.

Filters are tested and rated in accordance to ISO 12500 delivering certifiable performance in accordance to ISO 8573.1: 2009 air quality standards.

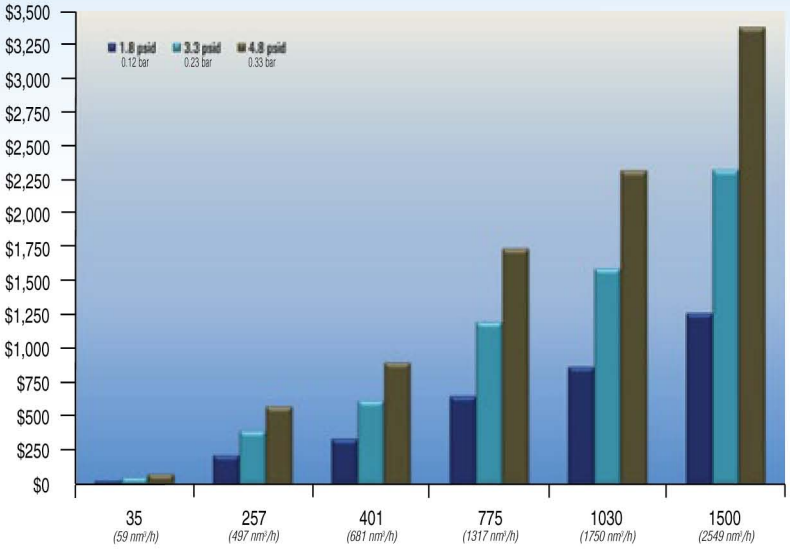
Save Money, Save Energy

The development of sustainable compressed air treatment solutions is the driving principle behind Deltech product designs. The 300 Series provides the perfect balance between high performance filtration and low pressure drop.

Patented filter elements *(US 7,618,480 B2)* maintain low pressure drop throughout its service life.

The economic service life of a filter is influenced by differential pressure. By minimizing resistance to flow, energy costs are significantly reduced.

The example demonstrates the effect of pressure drop on operating costs.



Flow scfm *(nm³/h)*

Example:

- Model: 315-H3 high efficiency coalescing filter
- Hours of Operation: 8000 hours
- Power Cost: $0.10/kWh
- Cost of Pressure Drop: $870/yr
- Flow: 1030 scfm (1750 nm³/h)
- Operating Pressure: 101.5 psig (7 bar)
- Pressure Drop: 1.8 psid (0.12 bar)

Under identical operation conditions, conventional filters maintain a higher cost of ownership:

- Pressure Drop: 3.3 psid (0.23 bar)
- Cost of Pressure Drop: $1596/yr
- Pressure Drop: 4.8 psid (0.33 bar)
- Cost of Pressure Drop: $2321/yr

ISO Air Quality Standards

ISO 12500

ISO 12500 defines a universal method for manufacturers to test and rate compressed air filters. Critical performance parameters are specified for inlet oil challenge and solid particulate concentration.

- ISO 12500-1 defines the testing of coalescing filters for oil aerosol removal performance.
- ISO 12500-2 quantifies vapor removal capacity of adsorption filters.
- ISO 12500-3 outlines requirements to test particulate filters for solid contaminant removal.

The 300 Series is tested to ISO 12500. Test results provide certifiable performance data based on defined challenge concentrations.

300 Series Filtration Performance

Element Grade	S3	P3	H3	U3	C3
*Particle Retention Size *(Per ISO 12500-3)*	3.0 μm	1.0 μm	0.01 μm	0.01 μm	0.01 μm
Particle Removal Efficiency *(Per ISO 12500-3)*	-	99.999+%	99.999+%	99.9999+%	99.999+%
Oil Removal Efficiency *(Per ISO 12500-1)*	50%	80%	99.9+%	99.99+%	_
**Remaining Oil Content *(Per ISO 12500-1)*	5.0 mg/m^3	2.0 mg/m^3	< 0.01 mg/m^3	< 0.001 mg/m^3	< 0.004 mg/m^3 *(as a vapor)*

* Solid particulate size distribution 0.01 to 5.0 μm
** Inlet oil challenge concentration 10 mg/m^3

ISO 8573.1: 2009 Air Quality Standard

ISO 8573, the international standard for compressed air quality, defines the amount of contamination permissible in compressed air.

- The standard identifies three primary forms of contamination in compressed air systems - solid particles, water and oil.
- Contaminants are classified and assigned a quality class, ranging from Class 0, the highest purity level, to Class 9, the most relaxed

Element Grade	ISO Quality Class Solids	ISO Quality Class Oil
S3	3	5
P3	2	4
H3	1	1
U3	1	1
C3	1	1 *(as a vapor)*

Deltech's 300 Series elements are performance validated to ISO 12500 ensuring air quality delivered is in accordance to ISO 8573.1: 2009 classifications

Air Quality Classes ISO 8573.1	Solid Particles			Humidity and Water		Oil	
	Maximum number of particles per m^3 Particle size (d), µm			Maximum Pressure Dew Point		Maximum Concentration, Aerosol, Liquid and Vapor	
	0.10 < d ≦ 0.5	0.5 < d ≦ 1.0	1.0 < d ≦ 5.0	°C	°F	mg / m^3	ppm w/w
0	As specified by the equipment user or supplier and more stringent than class 1						
1	≦ 20,000	≦ 400	≦ 10	≦ -70	≦ -94	≦ 0.01	≦ 0.008
2	≦ 400,000	≦ 6,000	≦ 100	≦ -40	≦ -40	≦ 0.1	≦ 0.08
3	-	≦ 90,000	≦ 1,000	≦ -20	≦ -4	≦ 1	≦ 0.8
4	-	-	≦ 10,000	≦ +3	≦ +37	≦ 5	≦ 4
5	-	-	≦ 100,000	≦ +7	≦ +45		
	Mass Concentration C_p (mg/m^3)						
6	0 < C_p ≦ 5			≦ +10	≦ +50		
				Liquid Water Content, C_w g/m^3			
7	5 < C_p ≦ 10			C_w ≦ 0.5			
8				0.5 < C_w ≦ 5			
9				5 < C_w ≦ 10			
X	C_p > 10			C_w > 10		> 5	> 4

** Not Specified Per ISO 8573.1: 2009*

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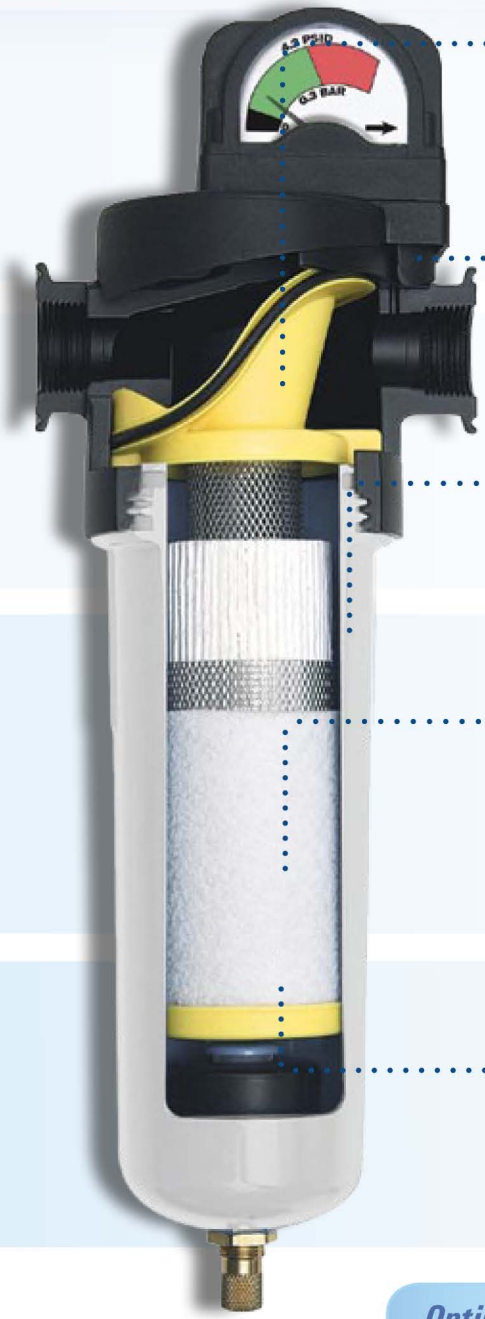
The Next Generation of Filtration



Patented Element Design

- The venturi profile promotes a turbulent-free transition for compressed air entering the element
- Optimized flow distribution through the element minimizes pressure loss and reduces system operating cost
- Unique backside contour assists smooth movement of air exiting the filter housing

Sculpted Design

- Covers flow ranges 20 scfm to 1500 scfm (34 to 2549 nm^3/h)
- Flanged inlet and outlet connections make installation easy
- Thirteen flow models, with multiple port sizes 1/4" to 3" NPT, allow for greater application flexibility
- Sculpted housing designs, with large unrestricted flow paths, reduce pressure drop

Safety Built-In

- Die cast aluminium housings provide a cost effective solution in the 1030 to 1500 scfm (1750 to 2549 nm^3/h) flow range
- Chromated housings, with a polyester epoxy powder coating for corrosion resistance
- Internally ribbed bowls facilitate condensate draining
- Audible alarm when attempting bowl removal under pressure

Deep Bed Pleated, High Performance Media

- Increased effective filtration surface area, reduces pressure drop by 50%
- 96% voids-volume ratio optimizes dirt loading capacity
- HEPA grade micro fiberglass media maximizes efficiency
- Thermally bonded polyester support layers minimize media migration
- Low wetted pressure for drop for life of the element
- Seam welded, stainless steel inner and outer support cores enhance dimensional stability of the element
- Chemically inert, non-aging polyester drain layer expedites removal of liquid
- All materials of construction are silicone free

Element Grade Identification

- Color coded element end caps promote ease of grade identification
- Bottom end caps pad printed with genuine Deltech filter element replacement part number

Optimize your Filtration Needs....

- Filter Clamps, Wall Mount Brackets, Gauges and Condensate Drains Available to maximize performance!

Total System Protection

The 300 Series provides protection for the entire compressed air system. A wide range of filters exceeds customer requirements for ISO Quality Class performance, service life and optimal energy savings.

Compressed air contamination exists in three states- solid, liquid and gaseous.

- Ingested contaminants appear in the form of water, hydrocarbons and particulates.
- The compression process introduces lubricant and wear particles into the system.
- Piping distribution and storage tanks foster contaminants in the form of rust, pipe scale and bacteria.

300 Series Element Specifications

Element Grade	Description	ISO Performance Data	Where Applied
 **Grade S3 Bulk Liquid Separator/Filter**	Separator/filter removes bulk liquid and solids.	• Removes solids 3 micron and larger • Remaining oil content 5 mg/m^3 ISO 8573.1: 2009 Air Quality Class: • Solid Particles - Class 3 • Remaining Oil Content - Class 5	Downstream of aftercoolers At point-of-use if no aftercooler/ separator used upstream
 **Grade P3 General Purpose Filter**	General purpose filtration to protect pneumatically operated tools, motors and cylinders.	• Removes solids 1.0 micron and larger • Remaining oil content 2.0 mg/m^3 ISO 8573.1: 2009 Air Quality Class: • Solid Particles - Class 2 • Remaining Oil Content - Class 4	Upstream of ultra high efficiency oil removal filters At point-of-use if aftercooler/ separator installed upstream Downstream of heatless desiccant dryers Upstream of refrigerated dryers
 **Grade H3 High Efficiency Oil Removal Filter**	Fine coalescer provides oil free air for industrial applications such as spray painting, injection molding, instrumentation and control valves.	• Removes 99.999+% of solids 0.01 micron and larger • Remaining oil content < 0.01 mg/m^3 ISO 8573.1: 2009 Air Quality Class: • Solid Particles - Class 1 • Remaining Oil Content - Class 1	Upstream of desiccant dryers Downstream of refrigerated dryers At point-of-use if aftercooler/ separator installed upstream
 **Grade U3 Ultra High Efficiency Oil Removal Filter**	Ultra fine coalescer delivers oil free air for critical applications including, conveying, electronics manufacturing and nitrogen replacement.	• Removes 99.9999+% of solids 0.01 micron and larger • Remaining oil content < 0.001 mg/m^3 ISO 8573.1: 2009 Air Quality Class: • Solid Particles - Class 1 • Remaining Oil content - Class 1	Upstream of desiccant dryers Upstream of membrane dryers (Use a PF Grade as a prefilter if heavy liquid loads are present) Downstream of refrigerated dryers
 **Grade C3 Oil Vapor Removal Filter**	Activated carbon filter removes oil vapor and provides oil free air for food and drug manufacturing, breathing air and gas processing.	• Removes solids 0.01 micron and larger • Remaining oil content < 0.004 mg/m^3 *(as a vapor)* ISO 8573.1: 2009 Air Quality Class: • Solid Particles - Class 1 • Remaining Oil Content - Class 1	Downstream of high efficiency oil removal filters

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300 Series Filter Selection

Model Configuration

3 - ① - ② - ③

① Housing-Connection-Flow

Model	Connection*	Flow @ 101.5 psig (7 bar)	
	NPT	scfm	nm³/h
02	1/4"	20	34
03	3/8"	35	59
04	1/2"	50	85
06	3/4"	75	127
07	3/4"	103	175
08	1.0"	157	267
10	1.5"	257	437
11	1.5"	360	612
12	2.0"	401	681
14	2.5"	775	1317
15	2.5"	1030	1750
16	3.0"	1200	2039
17	3.0"	1500	2549

*BSP threads are available. Add B to the model number. Example 302B-S3-DP1

② Element Grade

S3	Bulk Liquid Separator/Filter
P3	General Purpose
H3	High Efficiency Oil Removal
U3	Ultra High Efficiency Oil Removal
C3	Oil Vapor Removal

③ Options

T	Manual Drain
D	Internal Automatic Drain
P1	Differential Pressure Slide Indicator
G1	Differential Pressure Gauge
M	Electronic Filter Monitor
X	External Drain Adapter
Z1*	Electric Demand Drain (02-12)
Z2*	Electric Demand Drain (14-17)
W	External Mechanical Drain (14-17)

*Z1 and Z2 electric demand drain: Voltage 115 VAC 50-60 Hz

Example: 302-S3-DP1

Flow and Connection: 20 scfm (34 nm³/h); 1/4" NPT
Element Grade: S3- bulk liquid removal
Options: Internal automatic drain; differential pressure slide indicator

Capacity Correction Factors

The 300 Series flow capacities are rated per ISO 12500 conditions @ 101.5 psig (7 bar). To size the filter for non-standard conditions, a correction factor must be applied. Table 1 provides correction factors for inlet air pressure.

Do not select filters by pipe size; use flow rate and operating pressure.

Table 1 - Correction Factors for Inlet Pressure

Inlet Pressure	psig	20	30	40	60	80	100	120	150	200	250
	bar	1.4	2.0	2.8	4.1	5.5	6.9	8.3	10.3	13.8	17.2
Correction Factor		0.30	0.39	0.48	0.65	0.82	1.00	1.17	1.43	1.87	2.31

Adjusted Flow Capacity

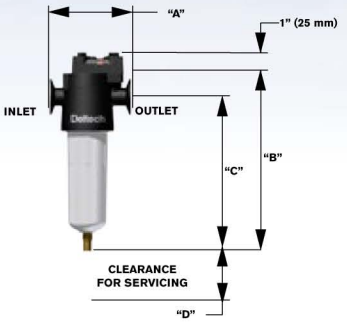
To calculate the flow capacity based on non-standard inlet conditions, multiply the filter's rated flow capacity by the corresponding inlet pressure correction factor.

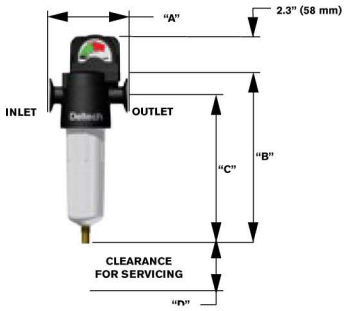
High Efficiency Coalescing Filter: 304-H3-DP1
Operating Conditions: 120 psig (8.3 bar)

Rated capacity: 50 scfm (85 nm³/h)
Adjusted Flow Capacity: 50 scfm x 1.17= 59 scfm (100 nm³/h)

300 Series Specifications

Model Number	Max. Flow @ 101.5 psig (7 bar)		Connections	Dimensions								Weight	
				"A"		"B"		"C"		"D"			
	scfm	nm^3/h	NPT	in	mm	in	mm	in	mm	in	mm	lbs	kg
302	20	34	1/4″	4.5	114	8.1	206	6.8	173	4.0	102	1.8	0.8
303	35	59	3/8″	4.5	114	8.1	206	6.8	173	4.0	102	1.8	0.8
304	50	85	1/2″	4.5	114	9.9	251	8.5	216	4.0	102	1.9	0.9
306	75	127	3/4″	5.2	132	10.3	262	8.7	221	5.0	127	3.1	1.4
307	103	175	3/4″	5.2	132	10.3	262	8.7	221	5.0	127	3.1	1.4
308	157	267	1.0″	5.2	132	12.8	325	11.7	297	5.0	127	3.5	1.6
310	257	437	1.5″	7.9	201	13.3	338	10.9	277	7.0	178	8.4	3.8
311	360	612	1.5″	7.9	201	17.1	434	14.7	373	7.0	178	9.9	4.5
312	401	681	2.0″	7.9	201	22.3	566	19.9	505	7.0	178	11.6	5.3
314	775	1317	2.5″	9.1	231	24.9	632	21.7	551	8.0	203	18.6	8.5
315	1030	1750	2.5″	9.1	231	24.9	632	21.7	551	8.0	203	18.6	8.5
316	1200	2039	3.0″	9.1	231	32.2	818	28.9	734	8.0	203	27.7	12.6
317	1500	2549	3.0″	9.1	231	42.7	1085	39.4	1001	8.0	203	41.3	18.8





Technical Specifications

Drain Option	Maximum Operating Pressure	Maximum Operating Temperature	Minimum Operating Temperature
Manual Drain	250 psig (17.6 bar)	150°F (66°C)	35°F (2°C)
Internal Float	250 psig (17.6 bar)	150°F (66°C)	35°F (2°C)
Electric Demand	232 psig (16.0 bar)	140°F (60°C)	35°F (2°C)
Externally Mounted Mechanical	150 psig (10.3 bar)	120°F (49°C)	35°F (2°C)

*300 Series Pressure Drop Performance**

Element Grade		Filter Description	Dry Δp		Wetted Δp	
			psig	bar	psig	bar
	S3	**Bulk Liquid Separator/Filter**	0.8	0.06	1.0	0.07
	P3	**General Purpose Filter**	0.6	0.04	1.4	0.10
	H3	**High Efficiency Oil Removal Filter**	0.6	0.04	1.8	0.12
	U3	**Ultra High Efficiency Oil Removal Filter**	0.8	0.06	2.0	0.14
	C3	**Oil Vapor Removal Filter**	1.0	0.07	-	-

*Pressure drop not to exceed stated values at ISO 12500 test conditions

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The Deltech Commitment

Deltech sets the standard of excellence in technology for today's growing industries.

We build relationships by understanding the requirements of our customers. As a result, the compressed air solutions we develop enable end users of Deltech products to meet their objectives of improved productivity and optimized efficiency. We will continue to dedicate our research and development resources to providing new and innovative air treatment products, inspired by our valued customers.

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