

Sample Filters

Application Recommendations

On-Line Process Analyzers

The variety of filtration requirements for on-line process analyzers precludes making general recommendations above for the required filtration functions. The filter housings most frequently used for process analyzer applications are the Model 95S6 and Model 91S6, which provide the corrosion resistance of Model 316 stainless steel (complies with NACE specification MR-01-75), a pressure rating of 5000 psig (345 barg), have full slipstream sampling capability, and minimum internal volume.



Figure 6
Model 95S6, 316 stainless steel with 5,000 psig pressure rating, is the filter housing most frequently used in process analyzers

Natural Gas Analyzers

To protect gas composition analyzers from liquids and solids, Grade DX or DQ filter tubes are recommended, with inside-out flow direction. If both slipstream sampling and coalescing are required, a two stage system must be used, as described on page 75.

The Model 85, 5000 psig (345 barg) rating and Model 37, 4000 psig (276 barg) rating housings comply with NACE specification MR-01-75. For lower pressure applications, any stainless steel housing of appropriate flow capacity may be used.



Figure 7
Model 85 (left) or Model 37/12 (right) are used for natural gas sample filtration when a housing larger than the Model 95S6 is required

Stack Gas Sampling

The Model 30 housing with Grade DH filter cartridge is used for quantitative determination of solids in stack gas, as described on page 68. The Model 30 may also be used as a beginning-of-the-line filter at stack gas temperature up to 900°F (95°C), to prevent solids from entering the gas sample line. Grade DH is used for this purpose. After the sample is cooled, a coalescing filter with Grade DX tube is used to remove suspended liquids before the sample goes to the analyzer. Flow direction is inside-to-outside. Model 33G or 45G housings are often used in this application to permit a visual check on the liquid level in the filter housing. Since there often is a considerable amount of liquid present at this point, positive steps must be taken to drain the housing to ensure that liquid does not build up and carry downstream to the analyzer.

The coalescing filter should be located as close to the analyzer as possible to minimize the chance of condensation between the filter and the analyzer. Additional precautions which can be taken to avoid downstream condensation are to cool the sample below ambient temperature upstream from the coalescing filter, and to heat the line.

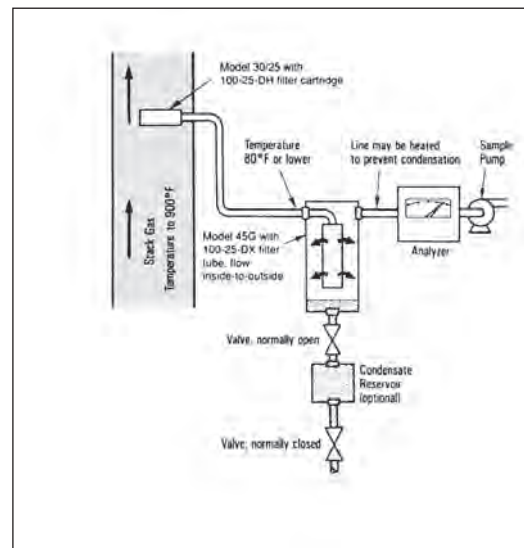


Figure 8
Stack gas sample lines usually require a high temperature solids filter at the sample point and a condensate separator immediately upstream from the analyzer

Sample Filters

Chemical and Temperature Resistance Selection

Chemical and Temperature Resistance of Filter Cartridges (For Temperatures Up To 75°F/24°C)*

Chemical or Solvent	X-Type or Q-Type with Fluorocarbon Resin Binder	H-Type With Quartz Construction	LP Cartridge With Polypropylene Support
Cold Water	Excellent	Fair	Excellent
Hot Water (to 180°F/82°C)	Excellent	Not Recommended	Excellent
Steam (to 20 psig/1.4 barg)	Excellent	Not Recommended	Not Recommended
Acids, except Hydrofluoric:			
Dilute concentrations	Excellent	Excellent	Excellent
Intermediate concentrations	Excellent	Excellent	Good
Concentrated, except phosphoric	Good-Fair	Excellent	Not Recommended
Concentrated phosphoric acid	Not Recommended	Not Recommended	Not Recommended
Hydrofluoric Acid	Not Recommended	Not Recommended	Not Recommended
Caustic, below 45%	Excellent	Not Recommended	Fair
Caustic, above 45%	Fair	Not Recommended	Not Recommended
Chlorine, liquid or gas	Excellent	Excellent	Not Recommended
Ammonia, liquid or gas	Not Recommended	Not Recommended	Fair
Ethylene Oxide, liquid or gas	Not Recommended	Not Recommended	See Pack 5
Aromatic Hydrocarbons	Excellent	Excellent	Good
All other Hydrocarbons	Excellent	Excellent	Excellent
Ketones	Not Recommended	Excellent	Fair
Alcohols	Excellent	Excellent	Excellent
Freons	Excellent	Excellent	Not Recommended
Phenol	Excellent	Excellent	Not Recommended
Chlorinated Solvents	Excellent	Excellent	Fair
Ethylene Diamine	Excellent	Excellent	Not Recommended
Ethanolamine	Not Recommended	Excellent	Not Recommended
Other Amines	Good-Fair	Excellent	Not Recommended
Polar Solvents, including: DMF, DMAC, NMP, DMSO	Not Recommended	Excellent	Not Recommended
Maximum Operating Temperature	300°F (150°C)	1000°F (538°C)	180°F (82°C)

*Consult factory for compatibility at elevated temperatures

Application Index

Operating Requirement	Filter Cartridge Type	Stainless Steel, Monel, or Aluminum Housing	Plastic Housing
Severe Operating Conditions			
Pressure 250 to 5000 psig (17.2 to 345 barg)	All	91S6, 97S6, 95M, 85, 37/12, 37/25, 27/35, 27/80, 95S6, 95A, 48S6, 49S6, 105S6, 47S6	N/A
Temperature 300°F (150°C) to 600°F (315°C)	H, M	Any stainless steel or Monel housing with Viton seals	N/A
Temperature 600°F (315°C) to 900°F (480°C)	H, M	30/12, 30/25	N/A
Exceptional Chemical Resistance	See chart above	95M/Monel	9922-□-□, 8822□-□/PVDF, 95T/PTFE 90/Polypropylene
NACE Compliance	All	95S6, 85, 37/12, 37/25, 27/35, 27/80	NA
Functional Requirements			
Separate liquids from gases	X, Q	All housings except 97S6, 30/12, 30/25, 48S6, 49S6, 47S6	8822-11, 8833-11, 95T
Separate two liquid phases	X, LP	All housings except 97S6, 30/12, 30/25, 48S6, 49S6, 47S6	8822-11, 8833-11, 95T
Remove gas bubbles from liquids	X, Q	All housings except 97S6, 30/12, 30/25, 48S6, 49S6, 47S6	8822-11, 95T
Quantitative measurement of solids in gases	H, Q	30/12, 30/25	N/A
Slipstream or Bypass Filtration	X, Q, LP, M	All housings except 97S6, 30/12, 30/25	8822-11, 95T, 53/18, 53/50
Filter liquids with high solids content	LP, M	All housings	All housings
Filter gas or liquid samples to analyzers	X, Q, LP, M	All housings	9933-05, 9922-05, 90

Sample Filters

Filter Cartridge, Housing Selection/Flow Rates for Liquid Filters

Flow Rates For Liquid Filters			Water Flow Rate, Gallons Per Hour						
Filter Housing Model	Volume of Housing		Initial Pressure Drop	Q or X Cartridges		LP Cartridges			
	Gallons	Liters		DQ, DX	BQ, BX	Grade 10	Grade 20	Grade 30	Grade 50
Stainless Steel, Monel and PTFE Housings									
105S6			1 psi (0.07 bar)	7 (0.44)	2 (0.13)	---	---	---	---
			5 psi (0.34 bar)	24 (1.51)	10 (0.63)	---	---	---	---
48S6			1 psi (0.07 bar)	14 (0.88)	4 (0.25)	---	---	---	---
			5 psi (0.34 bar)	51 (3.22)	21 (1.32)	---	---	---	---
95M, 95S6, 95T, 95A 91S6, 47S6 85	0.005 .009 0.015	0.02 0.036 0.06	1 psi (0.07 bar)	18 (1.14)	5 (0.32)	---	---	---	---
			5 psi (0.34 bar)	64 (4.04)	26 (1.64)	---	---	---	---
31S6	0.026	0.098	1 psi (0.07 bar)	54 (3.41)	13 (0.82)	---	---	---	---
31G			5 psi (0.34 bar)	129 (8.14)	56 (3.53)	---	---	---	---
49S6			1 psi (0.07 bar)	57 (3.60)	14 (0.88)	---	---	---	---
			5 psi (0.34 bar)	135 (8.52)	60 (3.79)	---	---	---	---
33S6 33G 37/12	0.042	0.16	1 psi (0.07 bar)	63 (3.97)	16 (1.01)	50 (3.15)	50 (3.15)	40 (2.52)	10 (0.63)
			5 psi (0.34 bar)	150 (9.46)	66 (4.16)	210 (13.25)	210 (13.25)	180 (11.36)	45 (2.84)
41S6	0.051	0.19	1 psi (0.07 bar)	95 (5.99)	30 (1.89)	---	---	---	---
41G			5 psi (0.34 bar)	260 (16.40)	121 (7.63)	---	---	---	---
37/25 45S6 45G	0.111	0.42	1 psi (0.07 bar)	109 (6.88)	35 (2.21)	75 (4.73)	75 (4.73)	60 (3.79)	15 (0.95)
			5 psi (0.34 bar)	300 (18.93)	140 (8.83)	300 (18.93)	300 (18.93)	260 (16.40)	65 (4.10)
27/35	0.394	1.49	1 psi (0.07 bar)	325 (20.50)	90 (5.68)	---	---	---	---
			5 psi (0.34 bar)	875 (55.20)	400 (25.24)	---	---	---	---
27/80	0.750	2.84	1 psi (0.07 bar)	390 (24.61)	170 (10.73)	---	---	---	---
			5 psi (0.34 bar)	990 (62.46)	610 (38.49)	---	---	---	---
15/80S6 (2)			1 psi (0.07 bar)	1650 (104.10)	720 (45.42)	---	---	---	---
			5 psi (0.34 bar)	4000 (252.36)	2500 (157.73)	---	---	---	---
Plastic Housings									
9922-05	0.003	0.01	1 psi (0.07 bar)	12 (0.76)	3 (0.19)	---	---	---	---
9933-05			5 psi (0.34 bar)	30 (1.89)	15 (0.95)	---	---	---	---
8822-11, 8833-11	0.005	0.02	1 psi (0.07 bar)	18 (1.14)	5 (0.32)	---	---	---	---
9922-11, 9933-11			5 psi (0.34 bar)	45 (2.84)	26 (1.64)	---	---	---	---
8800-12			1 psi (0.07 bar)	54 (1.14)	13 (0.32)	---	---	---	---
			5 psi (0.34 bar)	129 (2.84)	56 (1.64)	---	---	---	---
90			1 psi (0.07 bar)	23 (1.45)	10 (0.63)	---	---	---	---
			5 psi (0.34 bar)	46 (.90)	36 (2.27)	---	---	---	---
58P	0.034	0.13	1 psi (0.07 bar)	---	---	50 (3.15)	50 (3.15)	40 (2.52)	10 (0.63)
			5 psi (0.34 bar)	---	---	210 (13.25)	210 (13.25)	180 (11.36)	45 (2.84)
53/18	0.185	0.70	1 psi (0.07 bar)	---	---	100 (6.31)	100 (6.31)	100 (6.31)	40 (2.52)
			5 psi (0.34 bar)	---	---	360 (22.71)	360 (22.71)	360 (22.71)	190 (11.99)
53/50	0.346	1.31	1 psi (0.07 bar)	---	---	210 (6.31)	210 (6.31)	210 (6.31)	80 (2.52)
54/50			5 psi (0.34 bar)	---	---	720 (22.71)	720 (22.71)	720 (22.71)	390 (11.99)
53/95	0.661	2.50	1 psi (0.07 bar)	---	---	420 (26.50)	420 (26.50)	420 (26.50)	160 (10.09)
			5 psi (0.34 bar)	---	---	1440 (90.85)	1440 (90.85)	1440 (90.85)	780 (49.21)

Notes: 1 For liquids with viscosity higher than the viscosity of water (1 centipoise), divide the flow rates in the above table by the viscosity of the liquid in centipoises.
 Example: For liquid with 10 centipoise viscosity, flow rate with Model 53/50 housing, Grade 50 filter cartridges at 5 psi (0.34 bar) drop will be 390/10=39 GPH (2.5 lpm).
 2 Flow rates for Model 15/80S6 are estimated.

Flow Rates for Air and Gas Filters

Filter \Housing Model	Volume of Housing (ml)	Filter Tube Grade	Flow Rate (CFM) at 10" Water Press. Drop																							
			(1) Flow Rates, SCFM, at 2 PSI Drop at Indicated Line Pressure, PSIG Refer to Product Specification Charts for Maximum Pressure Rating of Each Housing																							
			0 psig	2 psig	20 psig	40 psig	60 psig	80 psig	100 psig	125 psig	150 psig	200 psig	250 psig	300 psig	500 psig	750 psig	1000 psig	1500 psig	2000 psig	2500 psig	3000 psig	3500 psig	4000 psig	4500 psig	5000 psig	
9922-05	11.33	DQ	0.2	1.2	2.5	3.9	5.4	6.8	8.3	10.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
4433-05		BQ	0.1	0.8	1.6	2.6	3.5	4.5	5.4	6.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
9900-05		DAU	N/A	0.5	1.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9933-05																										
8833-11		19.82	DX	0.4	1.8	3.6	6	8	10	12	14.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9922-11	BX		0.2	0.9	1.8	3	4	5	6	7.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
9933-11	DAU		N/A	0.7	1.7	10	3.7	4.3	5	27	32	41	52	60	99	147	195	290	386	482	578	674	770	886	962	
105S6																										
97S6	11.33		DQ	0.7	3	7	10	14	18	22	27	32	41	51	60	99	147	195	290	386	482	578	674	770	886	962
		BQ	0.2	0.9	1.8	3	4	5	6	7	9	11	14	16	26	39	52	77	103	128	154	179	205	230	256	
95A, 95M	19.82	DQ	1.5	3.9	8	13	18	22	27	33	39	51	62	74	121	180	239	357	470	590	710	830	940	1060	1180	
95S6, 95T		BQ	1.5	0.3	3	5	7	8	10	12	14	19	23	27	45	67	88	132	180	220	260	310	350	390	440	
91S6, 47S6																										
48S6		21	DQ	N/A	2.5	10	16	23	28	33	40	47	61	75	89	145	210	280	420	560	700	840	980	1120	1260	1400
			BQ	N/A	2	5	8	9	10	11	13	16	20	25	29	46	70	90	130	180	220	260	300	340	380	420
85	59.47	DX	2.2	5.9	12	19.5	26	32	41	50	58	76	92	111	182	270	360	540	710	890	1065	1245	1420	1600	1770	
		BX	0.4	2.2	4.6	7.7	10	12	15	18	22	28	34	41	68	113	134	200	265	325	400	475	530	590	660	
90	23.3	DQ, DX	3.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		BQ, BX	0.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
8800-12 (2)	93.45	DQ, DX	2.6	10	22	35	48	61	74	90	107	140	172	205	---	---	---	---	---	---	---	---	---	---	---	
31S6, 31G		BQ, BX	0.45	2	6	9	12	16	20	24	29	37	46	54	---	---	---	---	---	---	---	---	---	---	---	
		DAU	1.5	4.5	6.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
30/12, 33S6		DX	3.0	12	26	40	55	70	85	103	122	159	196	233	381	567	752	1122	1493	1863	2234	2600	2970	3340	3710	
33G, 37/12		BX	0.5	3	7	10	14	18	22	27	32	41	51	60	99	147	195	291	387	483	579	695	770	845	920	
49S6	170	DQ	N/A	13	28	45	61	78	94	115	135	177	218	259	423	629	834	1245	---	---	---	---	---	---	---	
		BQ	N/A	6	13	21	28	35	43	53	62	81	100	119	194	288	383	571	---	---	---	---	---	---	---	
41S6, 41G	220.87	DQ, DX	6.6	15	32	50	69	87	106	129	152	199	245	291	---	---	---	---	---	---	---	---	---	---	---	
		BQ, DX	1.1	7	15	24	32	41	50	61	72	93	115	139	---	---	---	---	---	---	---	---	---	---	---	
30/25, 45S6, 45G	419.09	DQ, DX	7.5	17	36	57	78	99	120	146	172	225	277	329	538	800	1062	1585	2108	2631	3156	3680	4200	4720	5240	
45S6, 45G		BQ, BX	1.3	8	17	26	36	45	55	67	79	103	127	151	247	367	487	727	976	1207	1447	1690	1930	2170	2410	
37/25																										
27/35		1500.80	DX	13.3	40	83	130	178	225	273	332	392	510	629	748	1220	1820	2410	3600	4780	5970	7160	8340	9530	10720	11900
26/35			BX	3.3	19	39	62	84	107	129	157	185	241	297	353	578	858	1140	1700	2260	2820	3380	3940	4500	5060	5630
27/80	2860.02	DX	20.0	43	90	142	193	245	297	362	426	555	684	814	1330	1980	2625	3900	---	---	---	---	---	---	---	
		BX	5.8	28	59	93	127	161	195	237	280	365	449	534	873	1300	1722	2540	---	---	---	---	---	---	---	
15/80S6	4700	DX	20.0	160	333	525	717	908	1100	1340	1580	2060	2540	3020	4940	---	---	---	---	---	---	---	---	---	---	
		BX	5.8	45	94	148	202	256	310	378	445	580	715	850	1390	---	---	---	---	---	---	---	---	---	---	

1 For line pressures above 150 PSIG, flow rate values are estimated.

2 Maximum operating pressure in gas service is 50 PSIG.

NA = DATA NOT AVAILABLE

Metric Flow Rates for Air and Gas Filters

Filter Housing Model	Volume of Housing (ml)	Filter Tube Grade	Flow Rate (l/m ² /hr) at 26 cm Water Press. Drop.																				
			(1) Flow Rates, Nm ³ /hr, at 0.14 BAR Drop at Indicated Line Pressure, BARC Refer to Product Specification Charts for Maximum Pressure Rating of Each Housing																				
			0.14 barg	1.14 barg	3 barg	4 barg	6 barg	7 barg	9 barg	10 barg	14 barg	17 barg	21 barg	35 barg	52 barg	69 barg	103 barg	138 barg	172 barg	207 barg	241 barg	276 barg	310 barg
9922-05	11.33	DQ	2.039	4.248	6.626	9.175	11.55	14.1	17.16	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4433-05		BQ	1.359	2.718	4.417	5.947	7.646	9.175	11.21	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9900-05		DAU	0.85	2.039	---	4.417	5.607	6.796	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9933-05		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8833-11	19.82	DX	3.058	6.116	10.19	13.59	16.99	20.39	24.81	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9922-11		BX	1.529	3.058	5.097	6.796	8.495	10.19	12.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---
9933-11	16	DAU	1.189	2.888	16.59	6.286	7.306	8.495	45.87	54.37	69.66	88.35	101.9	168.2	249.8	331.3	492.7	655.8	818.9	982	1145	1308	1505
105S6		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
97S6	11.33	DQ	5.097	11.89	16.99	23.79	30.58	37.38	45.87	54.37	69.66	86.65	101.9	168.2	249.8	331.3	492.7	655.8	818.9	982	1145	1308	1505
95A, 95M	19.82	BQ	1.529	3.058	5.097	6.796	8.495	10.19	11.89	15.29	18.69	23.79	27.18	44.17	66.26	88.35	130.8	175	217.5	261.6	304.1	348.3	390.8
95S6, 95T		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
91S6, 47S6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
48S6	21	DQ	4.248	16.99	27.18	39.08	47.57	56.07	67.96	79.85	103.6	127.4	151.2	246.4	356.8	475.7	713.6	951.4	1189	1427	1665	1903	2141
85	59.47	BQ	3.398	8.495	13.59	15.29	16.99	18.69	22.09	27.18	33.98	42.48	49.27	78.15	118.9	152.9	220.9	305.8	373.8	441.7	509.7	577.7	645.6
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90	23.3	DX	10.02	20.39	33.13	44.17	54.37	69.66	84.95	98.54	129.1	156.3	188.6	309.2	458.7	611.6	917.5	1206	1512	1809	2115	2413	2718
---	---	BX	3.738	7.815	13.08	16.99	20.39	25.49	30.58	37.38	47.57	57.77	69.66	115.5	192	227.7	339.8	450.2	552.2	679.6	807	900.5	1002
---	---	DQ, DX	5.097	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
---	---	BQ, BX	0.8495	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8800-12 (2)	93.45	DQ, DX	16.99	37.38	59.47	81.55	103.6	125.7	152.9	181.8	237.9	292.2	348.3	---	---	---	---	---	---	---	---	---	---
31S6, 31G		BQ, BX	3.398	10.19	15.29	20.39	27.18	33.98	40.78	49.27	62.86	78.15	91.75	---	---	---	---	---	---	---	---	---	---
---	---	DAU	2.549	7.646	11.55	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
30/12, 33S6	158.58	DX	5.097	20.39	44.17	67.96	93.45	118.9	144.4	175	207.3	333	395.9	647.3	963.3	1278	1906	2537	3165	3796	4417	5046	5046
33G, 37/12		BX	0.8495	5.097	11.89	16.99	23.79	30.58	37.38	45.87	54.37	69.66	86.65	101.9	168.2	249.8	331.3	494.4	657.5	820.6	983.7	1181	1308
49S6	170	DQ	22.09	47.57	76.46	103.6	132.5	159.7	195.4	229.4	300.7	370.4	440	718.7	1069	1417	2115	---	---	---	---	---	---
---		BQ	N/A	10.19	22.09	35.68	47.57	59.47	73.06	90.05	105.3	137.6	169.9	202.2	329.6	489.3	650.7	970.1	---	---	---	---	---
41S6, 41G	220.87	DQ, DX	11.2134	84.95	117.2	147.8	180.1	219.2	258.2	338.1	416.3	494.4	---	---	---	---	---	---	---	---	---	---	---
---		BQ, DX	1.8689	25.49	40.78	54.37	69.66	84.95	103.6	122.3	158	195.4	236.2	---	---	---	---	---	---	---	---	---	---
30/25	419.09	DQ, DX	28.88	61.16	96.84	132.5	168.2	203.9	248.1	292.2	382.3	470.6	559	914.1	1359	1804	2693	3581	4470	5362	6252	7136	7136
45S6, 45G		BQ, BX	2.2087	13.59	28.88	44.17	61.16	76.46	93.45	113.8	134.2	175	215.8	256.5	419.7	623.5	827.4	1235	1658	2051	2458	2871	3279
37/25	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
27/35	1500.80	DX	22.5967	67.96	141	220.9	302.4	382.3	463.8	564.1	666	866.5	1069	1271	2073	3092	4095	6116	8121	10143	12165	14170	16191
26/35		BX	5.6067	32.28	66.26	105.3	142.7	181.8	219.2	266.7	314.3	409.5	504.6	599.7	982	1458	1937	2888	3840	4791	5743	6694	7646
27/80	2860.02	DX	33.98	73.06	152.9	241.3	336.2	416.3	504.6	615	723.8	942.9	1164	1383	2260	3364	4460	6626	---	---	---	---	---
---		BX	9.8542	47.57	100.2	158	215.8	273.5	331.3	402.7	475.7	620.1	762.9	907.3	1483	2209	2926	4315	---	---	---	---	---
15/60S6	4700	DX	33.98	271.8	565.8	892	1218	1543	1869	2277	2684	3500	4315	5131	8393	---	---	---	---	---	---	---	---
---		BX	9.8542	76.46	159.7	251.5	343.2	434.9	526.7	642.2	756.1	985.4	1215	1444	2362	---	---	---	---	---	---	---	---

NA = DATA NOT AVAILABLE

1 For line pressures above 150 PSIG, flow rate values are estimated.

2 Maximum operating pressure in gas service is 50 PSIG.

Sample Filters

Sample Filters

Miniature Filter Housings: Convenient T-type Filters

Stainless steel, PTFE, or Monel construction

Pressure to 5000 psig (345 barg)

T-type construction allows for non-disruptive maintenance

Ideal sample filters for on-line analyzers

Models 91S6, 95A, 95M, 95S6, 95T, 105S6

These models are miniature T-type filters constructed of 316 stainless steel (5000 psig/345 barg), PTFE (150 psig/10.3 barg), and other specialty materials. With only 19 ml internal volume and the opportunity for by-pass or slipstream filtration using the drain port as an exit port, the model 95 filters are ideal sample filters for on-line analyzers. The model 105S6 has a small internal volume of 15 ml, which is ideal for applications requiring fast sampling response time.



Models 91S6, 95A, 95M, 95S6, 95T (95S6 Shown)



Model 105S6

Principal Specifications

Model	105S6	91S6	95A	95M	95S6	95T
Inlet and Outlet Ports	1/8" NPT (1)	1/8" NPT (1)	1/8" NPT (1)	1/8" NPT (1)	1/8" NPT (1)	1/8" NPT (1)
Drain Port	1/8" NPT	1/8" NPT	1/8" NPT	1/8" NPT	1/8" NPT	1/8" NPT
Materials of Construction						
Head	316SS (2)	316SS (2)	Aluminum	Monel	316SS (2)	PTFE (2)
Bowl	316SS (2)	316SS (2)	Aluminum	Monel	316SS (2)	PTFE (2)
Internals	316SS (2)	316SS (2)	Aluminum	Teflon	316SS (2)	PTFE (2)
Seals	Viton	Viton	Viton	Viton	Viton	PTFE/Viton
Maximum Temperature	400°F (204°C)	400°F (204°C)	200°F (93°C)	400°F (204°C)	400°F (204°C)	300°F (149°C)
Maximum Pressure	5000 psig (345 barg) (3)	1500 psig (103 barg) (3)	2500 psig (172 barg) (3)	5000 psig (345 barg) (3)	5000 psig (345 barg) (3)	150 psig (10.3 barg) (3)
Shipping Weight	1 lb. (0.4 kg)	1 lb. (0.4 kg)	0.5 lb. (0.2 kg)	1 lb. (0.4 kg)	1 lb. (0.4 kg)	0.5 lb. (0.2 kg)
Dimensions	1.8"D X 3.3"L (4cm X 8cm)	1.5"D X 3.7"L (3.8cm X 9.4cm)	1.8"D X 4"L (4cm X 10cm)	1.8"D X 4"L (4cm X 10cm)	1.8"D X 4"L (4.6cm X 10.2cm)	1.8"D X 4"L (4.6cm X 10.2cm)

Notes:

1 Also available with 1/4" NPT ports. To order with 1/4" NPT ports, use designation Model 95S6-1/4, etc.

2 Constructed of materials which comply with NACE Specification MR-01-75. Request certificate of compliance.

3 Maximum pressure ratings are for temperatures to 200°F (93°C). Please consult factory for maximum pressure ratings at elevated temperatures.

Ordering Information For assistance, call toll-free at 1-800-343-4048 8AM to 5PM Eastern Time

Model	105S6	91S6	95A	95M	95S6	95T
Support Core, Required for Liquid Filtration	Included	Included	Included	Included	Included	Included
Filter Cartridges	050-07-□	050-11-□	050-11-□	050-11-□	050-11-□	050-11-□
Use only these filter types	Q, H	Q, H	Q, H	Q, H, M	Q, H, M	Q, H, M

Sample Filters

Low Internal Volume Filter Housings: 1/4" and 1/2" Port Size

Stainless steel construction

Pressure to 250 psig (17 barg)

Temperature to 400°F (204°C)

Compact design

Models 91S6, 31S6, 31G, 41S6, 41G

These models offer compact designs and half the dead volume of other sample filters resulting in faster sampling times. They are constructed of stainless steel and available with a variety of seals for easy adaptation to demanding applications. If larger amounts of condensate are expected, specify 33 or 45 series.



Models 31G, 41G
(41G Shown)



Model 91S6



Models 31S6, 41S6
(31S6 Shown)

Sample
Filters

Principal Specifications

Model	91S6	31G	41G	31S6	41S6
Inlet and Outlet Ports	1/8" NPT (1)	1/2" NPT (1)	1/2" NPT (1)	1/2" NPT (1)	1/2" NPT (1)
Drain Port	1/8" NPT	1/4" NPT	1/4" NPT	1/4" NPT	1/4" NPT
Materials of Construction					
Head	316SS (2)	316SS	316SS	316SS	316SS
Bowl	316SS (2)	Pyrex	Pyrex	316SS	316SS
Internals	316SS (2)	316SS	316SS	316SS	316SS
Seals	Viton	Viton	Viton	Viton	Viton
Maximum Temperature	400°F (204°C)	160°F (71°C)	160°F (71°C)	400°F (204°C)	400°F (204°C)
Maximum Pressure	1500 psig (103 barg) (3)	100 psig (6.9 barg) (3)	100 psig (6.9 barg) (3)	425 psig (29.3 barg) (3)	250 psig (17.2) (3)
Shipping Weight	1 lb. (0.4 kg)	2 lbs (0.9 kg)	4 lbs (1.8 kg)	3 lbs (1.4 kg)	5 lbs (2.3 kg)
Dimensions	1.5"D X 3.7"L (3.8cm X 9.4cm)	2.2"D X 5.5"L (5.7cm X 14cm)	2.2"D X 10.0"L (5.7cm X 26cm)	2.25"D X 5.5"L (5.7cm X 14cm)	2.25"D X 10"L (5.7cm X 25.4cm)

Notes:

1 Also available with 1/4" NPT ports. To order with 1/4" NPT ports, use designation Model 31G-1/4 etc.

2 Constructed of materials which comply with NACE Specification MR-01-75. Request certificate of compliance.

3 Maximum pressure ratings are for temperatures to 200°F (104°C). Please consult factory for maximum pressure ratings at elevated temperatures.

Ordering Information

For assistance, call toll-free at 1-800-343-4048 8AM to 5PM Eastern Time

Filter Housing Model	91S6	31G	41G	31S6	41S6
Support Core, Required for Liquid Filtration	Included	SS-100-12	SS-100-25	SS-100-12	SS-100-25
Filter Cartridges	050-11-□	100-12-□	100-25-□	100-12-□	100-25-□
Use only these Filter cartridge types	Q, H, M	X, H, Q, M	X, H, Q	X, H, Q, M	X, H, Q

0.01 Micron Membrane Filters

Stainless Steel or PTFE Filter Housings - 1/8" to 1/2" Line Size

97S6

Miniature 316 stainless steel filter, with 1/4" NPT in-line ports, 5000 psig (345 barg) rating. The 97S6 has a replaceable membrane cartridge and is an economical alternative when a disposable product is not required.



Model 97S6



Model 91S6, 95S6, 95T
(95S6 Shown)

91S6, 95S6, 95T

Miniature T-Type filters in 316 stainless steel. The 91S6 is rated for 650 psig (45 barg), the 95S6 is rated for 5000 psig (345 barg). The 95T is constructed of PTFE, and is rated at 150 psig (10 barg). The membrane cartridge is changed without breaking the inlet or outlet connections.

31S6, 33S6

Have 1/4" or 1/2" ports, 425 psig (29 barg) rating, can handle a higher gas flow rate, and have greater solids holding capacity than the Type 95 filters.



Model 31S6, 41S6
(31S6 Shown)

41S6, 45S6

Are higher flow rate stainless steel filters with 1/4" or 1/2" NPT ports. The Type 45, with stainless steel bowl, has a 250 psig (17 barg) rating.



Model 33S6, 45S6
(45S6 Shown)

Membrane
Filters

0.01 Micron Membrane Filters

Stainless Steel or PTFE Filter Housings - 1/8" to 1/2" Line Size

Principal Specifications

Model	97S6	91S6	95S6	95T	31S6, 33S6	41S6, 45S6
Inlet and Outlet Ports	1/4" NPT	1/8" NPT (2)	1/8" NPT (2)	1/8" NPT (2)	1/2" NPT (2)	1/2" NPT (2)
Drain Port	None	1/8" NPT	1/8" NPT	1/8" NPT	1/4" , 1/8" NPT (6)	1/4" , 1/8" NPT (6)
Materials of Construction						
Head	316SS	316SS	316SS (4)	PTFE (4)	316SS	316SS
Bowl	316SS	316SS	316SS (4)	PTFE (4)	316SS	316SS
Internals	316SS	316SS	316SS (4)	PTFE (4)	316SS	316SS
Seals	Viton (5)	PTFE (3)	PTFE (3)	Viton (3,5)	Viton (5)	Viton (5)
Maximum Temperature	400°F(204°C)	400°F(204°C)	400°F(204°C)	300°F(149°C)	400°F(204°C)	400°F(204°C)
Maximum Pressure	5000 psig (345 barg) (1)	1500 psig (45 barg) (1)	5000 psig (345 barg) (1)	150 psig (10 barg) (1)	425 psig (29 barg) (1)	250 psi (17 barg) (1)
Shipping Weight	0.8 lbs (0.4 kg)	1.2 lbs. (0.5 kg)	1.3 lbs. (0.6 kg)	0.5 lbs. (0.2 kg)	5 lbs. (2.3 kg)	5.5 lbs. (2.5 kg)
Dimensions	1.25"D X 3.1"L (3.2cm X 7.9cm)	1.5"D X 3.7"L (3.8cm X 9.4cm)	1.8"D X 4"L (4.6cm X 10.2cm)	1.8"D X 4"L (4.6cm X 10.2cm)	2.25"D X 5.5"L (31S6) 2.6"D X 4.5"L (33S6) (5.7cm X 14cm) (31S6) (6.6cm X 11.4cm) (33S6)	2.25"D X 10"L (41S6) 2.6"D X 9"L (45S6) (5.7cm X 25.4cm)(41S6) (6.6cm X 22.9cm) (45S6)

Ordering Information

For assistance, call toll-free at 1-800-343-4048 8AM to 6PM Eastern Time

Housing Only Model	Membrane Cartridge No. Required	Membrane Cartridges (Order Separately)	
		Box of 3	Box of 10
97S6	1	GS-3/050-05-95	GS-050-05-95
91S6	1	GS-3/050-11-95	GS-050-11-95
95S6	1	GS-3/050-11-95	GS-050-11-95
95T	1	GS-3/050-11-95	GS-050-11-95
31S6, 33S6	1	GS-3/100-12-95	GS-100-12-95
41S6, 45S6	1	GS-3/100-25-95	GS-100-25-95

Notes

1 Maximum pressure ratings are for temperatures to 200°F (93°C). Please consult factory for maximum pressure ratings at elevated temperatures.

2 Also available with 1/4" NPT ports, use designation Type 33S6-1/4 or 45S6-1/4.

3 PTFE encapsulated Viton seals are standard.

4 Constructed of materials which comply with NACE Specification MR-01-75. Request Certificate of Compliance.

5 PTFE encapsulated Viton and other seals are available upon request. Please consult factory.

6 Drain port for types 31S6 & 41S6 is 1/4".

0.01 Micron Membrane Filters

Flow Rates

Filter Housing	Flow Rates, SCFM (Nm ³ /hr), at 2 psi (0.14 bar) Drop at Indicated Line Pressure (barg)													
	2 (0.1)	20 (1.4)	60 (4.1)	100 (6.9)	125 (8.6)	150 (10)	200 (14)	300 (21)	500 (34)	1000 (69)	2000 (138)	3000 (207)	4000 (276)	5000 (345)
9933-05-95	0.5 (0.8)	1.0 (1.7)	1.5 (2.5)	2.0 (3.4)	2.2 (3.7)	—	—	—	—	—	—	—	—	—
9922-11-95	0.5 (0.8)	1.0 (1.7)	1.7 (2.9)	2.2 (3.7)	2.3 (3.9)	—	—	—	—	—	—	—	—	—
91S6	0.5 (0.8)	1.0 (1.7)	1.8 (3.1)	2.5 (4.2)	2.8 (4.8)	3.0 (5.1)	3.4 (5.8)	4.1 (7.0)	5.3 (9.0)	—	—	—	—	—
95S6	0.5 (0.8)	1.0 (1.7)	1.8 (3.1)	2.5 (4.2)	2.8 (4.8)	3.0 (5.1)	3.4 (5.8)	4.1 (7.0)	5.3 (9.0)	7.4 (12.6)	10.5 (17.8)	12.9 (21.9)	14.8 (25.1)	16.5 (28.0)
95T	0.5 (0.8)	1.0 (1.7)	1.8 (3.1)	2.5 (4.2)	2.8 (4.8)	3.0 (5.1)	—	—	—	—	—	—	—	—
97S6	0.5 (0.8)	1.0 (1.7)	1.7 (2.9)	2.3 (3.9)	2.5 (4.2)	2.7 (4.6)	3.1 (5.3)	3.7 (6.3)	4.8 (8.2)	6.7 (11.4)	9.4 (16.0)	11.5 (19.5)	13.3 (22.6)	14.9 (25.3)
31S6, 33S6	1.0 (1.7)	2.1 (3.6)	4.6 (7.8)	7.0 (11.9)	7.7 (13.1)	8.4 (14.3)	9.6 (16.3)	11.6 (19.7)	—	—	—	—	—	—
37/12									14.8 (25.1)	20.8 (35.3)	29.3 (49.8)	35.9 (61.0)	41.4 (70.3)	—
41S6, 45S6	3.0 (5.1)	6.0 (10.2)	13.0 (22.1)	20.0 (34.0)	22.0 (37.4)	24.0 (40.8)	27.4 (46.6)	—	—	—	—	—	—	—
37/25								33.1 (56.2)	42.4 (72.0)	59.5 (101.1)	83.8 (142.4)	102.0 (173.3)	118.0 (200.5)	—