Filters for the Food Industry

Stainless Steel Harsh Environment Filters for Food Processing and Packaging

All 304 stainless steel construction, ideal standing up to aggressive washdown chemicals

Remove 99.99% of 0.01 micron particles of oil, water, and dirt from compressed air and other gases

For Sterile Air Requirements:

Remove all viable organisms

USDA/FSIS accepted for use in federally inspected meat and poultry plants

Low pressure drop

Continuously trap and drain liquids

Remove trace oil vapor with adsorbent cartridges

Models 6006 and 6008

Balston® Stainless Steel Compressed Air Filter Assemblies

Protect your equipment and delicate instruments from the dirt, water, and oil usually found in compressed air and other gases. These filters will remove contaminants at a very high efficiency - up to 99.99% for 0.01 micron particles and droplets. Liquid releases from the filter cartridge to an automatic drain as rapidly as it enters the filter. This allows the filter to continue removing liquids for an unlimited time without loss of efficiency for flow capacity. Select 1/4" to 1" line filters are constructed of 304 stainless steel and are designed to hold up to the harshest environments.

Filters for the Food Industry

Stainless Steel Harsh Environment Filters for Food Processing and Packaging

Filter Cartridge Description

General purpose applications such as plant compressed air	Single stage filtration. Use a Grade DX filter cartridge
Instrument air and other critical air requirements	Two stage filtration is necessary. Use a Grade DX followed by a Grade BX filter cartridge. As a general rule, a Grade BX filter cartridge should not be used alone.
Removal of trace compressor oil vapor	For rare instances where even a trace amount of oil vapor can cause a problem, three stage filtration is necessary. Use a Grade DX followed by a Grade BX, and a type CI cartridge.

Physical Properties, Microfibre Filter Cartridges

Temperature Range	-150°F to 300°F (-100°C - 149°C)
Maximum Pressure Differential Across Filter, Inside-to-Outside Flow:	100 psi (7 barg)
Materials of Construction	Borosilicate glass microfibers with fluorocarbon resin binder. Resistant to water, all hydrocarbon and synthetic lubricants.

Retention Efficiency

Grade	Efficiency for 0.01 Micron Particles and Droplets
DX	93%
BX	99.99%

Balston Filter Cartridges

Parker provides two grades of coalescing filter cartridges, Grade DX and Grade BX. Singly or in tandem, these filters satisfy all requirements for removing liquid and solid contaminants from compressed air. Parker also has an activated carbon adsorbent CI-type cartridge for the removal of trace oil vapors from a compressed air line. The activated carbon cartridge is Grade 000.

How to Select the Filter Cartridge and Housing

1. Decide which grade(s) of filter cartridges fits the application (see selection boxes at left).
2. Select the filter housing with a port size equal to the line size where the filter is to be located.
3. For a new installation in which the line size has yet to be selected, determine the gas flow rate and pressure at the point where the filter will be located, and then refer to the flow chart on the reverse side of this data sheet. NOTE: The filter port size must be equal to or larger than the line size (when specified).

How to Order the Filter Assembly

1. Build your own custom filter assembly using the guideline matrix on Page 170 and specify your model number. Example: 1/2" filter with DPI and Auto Drain with Grade DX Filter = 6004N-01A-DX.
2. Each assembly is shipped with the filter cartridge installed. To order additional filter cartridges, indicate the model number of the cartridges, and the grade. Examples 050-05-DX, 050-05-BX. The grade used for Type CI cartridges is 000 (CI-100-12-000).

Note: Assemblies with CI Cartridges are shipped with the adsorbent cartridge wrapped separately. This shipping method prolongs the life of the cartridge.

Filters for the Food Industry

Stainless Steel Harsh Environment Filters
1/4" to 1" Line Size

Models 6102, 6002, 6904

The 6002 series models are 1/4” line size filters designed for lower flow systems and installations with space limitations. Models 6102 and 6002 are offered with two drain options: a manual drain or an auto float drain, for maintenance-free operation. Model 6904 offers 1/2” inlet and outlet connections for applications requiring 1/2” pipe with space limitations.

Model 6004

The 6004 series models are 1/2” line size filters designed for moderate flow rate systems. This series has increased liquid holding capacity, which safeguards sensitive end use points from system upsets and morning start ups.

Models 6006 and 6008

The 6006 and 6008 series models are 3/4” and 1” line size filters respectively. These are designed for high flow rate systems servicing multiple end use points. These are also offered with a high capacity auto float drain option.

Models 6102, 6002, 6904 — Model 6004

Models 6006 and 6008

How to Order the Filter Assembly*

Build your own custom filter assembly using the guideline matrix below and specify your model number. Example: 1/2” filter with Auto Drain and Grade DX Filter = 6004N-0A1-DX.

***Consult Factory. Not all configurations are available.**

□□□□□ □□□ □□□

- **6102** 1/4” Ports
- **6002** 1/4” Ports
- **6904** 1/2” Ports Short Bowl
- **6004** 1/2” Ports
- **6006** 3/4” Ports
- **6008** 1” Ports

N NPT Thread Inlet & Outlet Ports

0A2 Manual Drain

0A1 Auto Drain

Filter Grade
- **000**
- **SA**
- **DX**
- **BX**

Leave blank for no filter Cartridge

Filters for the Food Industry

Stainless Steel Harsh Environment Filters
1/4" to 1" Line Size

Flow Rates

Filter Housing Model	Port Size	Filter Cartridge Grade	Flow rates SCFM (Nm³/hr), at 2 psi (0.14 bar) (1) drop at indicated line pressure. Refer to Principal Specification Charts in each product data sheet for maximum pressure rating of each housing PSIG								
			2 (0.1)	20 (1.4)	40 (2.8)	80 (5.5)	100 (6.9)	125 (8.6)	150 (10)	200 (14)	250 (17)
6102N	1/4"	DX	13.5 (23)	8 (14)	11 (19)	20 (34)	25 (42)	30 (51)	36 (61)	---	---
		BX	1 (2)	2 (3)	3.5 (6)	5.7 (10)	6.8 (12)	8 (14)	10 (17)	---	---
6002N	1/4"	DX	9 (15)	19 (32)	39 (66)	51 (87)	63 (107)	76 (129)	90 (153)	117 (199)	145 (246)
6904N	1/2"	BX	3 (5)	8 (14)	11 (19)	21 (36)	25 (42)	31 (53)	36 (61)	47 (80)	58 (99)
		CI	2 (3)	5 (8)	7 (12)	12 (20)	15 (25)	18 (31)	22 (37)	28 (48)	35 (59)
		SA	---	8 (14)	11 (19)	21 (36)	25 (42)	31 (53)	36 (61)	---	---
6004N	1/2"	DX	19 (32)	41 (70)	65 (110)	113 (192)	137 (233)	166 (282)	196 (333)	257 (473)	316 (537)
		BX	9 (15)	19 (32)	30 (51)	51 (87)	63 (107)	76 (129)	90 (153)	117 (199)	145 (246)
		CI	6 (10)	12 (20)	19 (32)	32 (54)	39 (66)	48 (82)	56 (95)	73 (124)	90 (153)
		SA	---	19 (32)	30 (51)	51 (87)	63 (107)	76 (129)	90 (153)	---	---
6006N	3/4"	DX	37 (63)	78 (133)	123 (209)	214 (364)	259 (440)	315 (535)	371 (630)	484 (822)	596 (1013)
		BX	10 (17)	21 (36)	34 (58)	56 (95)	70 (119)	85 (144)	101 (172)	131 (223)	162 (275)
		CI	8 (14)	16 (27)	26 (44)	44 (75)	53 (90)	65 (110)	76 (129)	99 (168)	122 (207)
		SA	---	21 (36)	34 (58)	56 (95)	70 (119)	85 (144)	101 (172)	---	---
6008N	1"	DX	55 (93)	115 (195)	181 (308)	314 (533)	380 (646)	463 (787)	546 (928)	711 (1208)	877 (1490)
		BX	11 (19)	23 (39)	37 (63)	64 (109)	77 (131)	94 (160)	111 (189)	144 (245)	178 (302)
		CI	10 (17)	20 (34)	32 (54)	56 (95)	67 (114)	82 (139)	96 (163)	125 (212)	154 (262)
		SA	---	23 (39)	37 (63)	64 (109)	77 (131)	94 (160)	111 (189)	---	---

Notes:
1 The SA filter grade produces a 3 psi at maximum rated flow differential pressure drop.

Sterile Air Filters

Balston grade SA filter cartridges, rated at 99.9999+% efficiency for 0.01 micron particles, is at least 30 times better than the accepted standard for sterile air filters developed by independent research organizations in the U.S. and U.K. (request bulletin TI-105A for a detailed discussion on Balston filter efficiency rating procedure, and Bulletin TI-935 for an independent test report on balstonSterile Air Filters). Balston Sterile Air Filters are in full compliance with the requirements of the FDA.

Steam Sterilization Procedure

In installations where the sterile air filter requires steam sterilization, we recommend the following procedures:

The steam sterilization pressure should not exceed 60 psig (4 barg). Preferably, it should be held to 40 psig (3 barg) or less. A typical sterilization cycle is 30 psig (2 barg) steam for 30 minutes. Steaming time can be increased as desired without harm to the filter cartridges. The steam flow should not exceed the normal air flow for the unit. To ensure no buildup of condensate in the housing, condensate should be drained from the filter by a condensate drain valve during the steaming process. The cleanliness of the steam is an important factor influencing the life of the Sterile Air Filter cartridges. Parker strongly recommends using Model 23 Steam Filters to ensure optimum operating life. When autoclaving, the Grade SA filter cartridges will tolerate temperatures to 300°F (149°C) in dry gas. Viton or other heat resistant seals should be used in the housing.

Filters for the Food Industry

Stainless Steel Harsh Environment Filters

Principal Specifications

Model	6102	6002	6904	6004	6006	6008
Port Size	1/4" NPT	1/4" NPT	1/2" NPT	1/2" NPT	3/4" NPT	1" NPT
Materials of Construction						
Head	316 Stainless Steel	304 Stainless Steel →				
Bowl	316 Stainless Steel	304 Stainless Steel →				
Internals	Acetal	Stainless Steel →				
Seals	Viton	Buna-N Food Grade →				
Maximum Temperature	140°F (60°C) (1)	120°F (49°C) (1) →				
Maximum Pressure	150 psig (10 barg) (2)	175 psig (12 barg) (2) →				
Minimum Pressure	15 psig (1 barg) (3)	15 psig (1 barg) (3) →				
Shipping Weight	3.5 lbs. (1.6 kg)	3.5 lbs. (1.6 kg)	3.5 lbs. (1.6 kg)	4.0 lbs. (18 kg)	11 lbs. (5 kg)	12 lbs. (5.5 kg)
Dimensions	1.5"W x 4.2"L (3.8cm x 11.7cm)	3"W X 7"L (7cm X 18cm)	3"W X 7"L (7cm X 18cm)	3"W X 10"L (7cm X 25cm)	4"W X 10"L (10cm X 25cm)	4"W X 12"L (10cm X 30cm)

Notes:
1 Max. temperature with auto drain Max. temperature with manual drain is 275°F (135°C).
2 Max. pressure with auto drain. Max. pressure with manual drain is 250 psi (17 barg).
3 Required for proper operation of auto drain.

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

Assembly Ordering Information

Model P/N	Filter Tube	Drain (Manual)	Drain (Auto. Float)	Mounting Bracket (stainless steel)
6102N-0A0-(?X)	070-063-(?X)	SAP05481	N/A	N/A
6102N-0A1-(?X)	070-063-(?X)	N/A	C02-2392	N/A
6002N-0A2-(?X)	100-12-(?X)	C01-0108	N/A	C01-0094
6002N-0A1-(?X)	100-12-(?X)	N/A	C01-0109	C01-0094
6002N-0A2-SA	100-12-SA	C01-0108	N/A	C01-0094
6002N-0A2-000	CI-100-12-000	C01-0108	N/A	C01-0094
6904N-0A2-(?X)	100-12-(?X)	C01-0108	N/A	C01-0094
6904N-0A1-(?X)	100-12-(?X)	N/A	C01-0109	C01-0094
6904N-0A2-SA	100-12-SA	C01-0108	N/A	C01-0094
6904N-0A2-000	CI-100-12-000	C01-0108	N/A	C01-0094
6004N-0A2-(?X)	100-18-(?X)	C01-0108	N/A	C01-0094
6004N-0A1-(?X)	100-18-(?X)	N/A	C01-0109	C01-0094
6004N-0A2-SA	100-18-SA	C01-0108	N/A	C01-0094
6004N-0A2-000	CI-100-18-000	C01-0108	N/A	C01-0094
6006N-0A2-(?X)	200-176-(?X)	C01-0108	N/A	C01-0094
6006N-0A1-(?X)	200-176-(?X)	N/A	C01-0109	C01-0094
6006N-0A2-SA	200-176-SA	C01-0108	N/A	C01-0094
6006N-0A2-000	200-176-000	C01-0108	N/A	C01-0094
6008N-0A2-(?X)	200-185-(?X)	C01-0108	N/A	C01-0094
6008N-0A1-(?X)	200-185-(?X)	N/A	C01-0109	C01-0094
6008N-0A2-SA	200-185-SA	C01-0108	N/A	C01-0094
6008N-0A2-000	CI-200-185-000	C01-0108	N/A	C01-0094

Replacement Filter Cartridge Ordering Information

Model P/N	6102	6002/6904	6004	6006	6008
Replacement Filter Cartridges					
Number required	1	1	1	1	1
Box of 5	5/070-063-(?X)	5/100-12-(?X)	5/100-18-(?X)	5/200-176-(?X)	5/200-185-(?X)
Box of 10	070-063-(?X)	100-12-(?X)	100-18-(?X)	200-176-(?X)	200-185-(?X)
Box of 10	070-063-SA	100-12-SA	100-18-SA	200-176-SA	200-185-SA
CI Cartridges (box of 1)	---	CI-100-12-000	CI-100-18-000	CI-200-176-000	CI-200-185-000

Filters for the Food Industry

Balston 2 Stage Compressed Air Filter Systems

Full-featured with differential pressure indicators, auto drains, sight glasses, pressure relief valve, and bayonet bowl-to-head connection

Lifetime (20 year) warranty

Continuously trap and drain liquids

Remove 99.99% of 0.01 micron particles of oil, water, and dirt from compressed air and other gases

Low pressure drop

Applications:

These filters are ideal for safeguarding critical production equipment from corrosive compressor condensate that can cause catastrophic failures and unexpected downtime. Ideal applications are:

- **Instrumentation**
- **Air actuators and air cylinders**
- **Pneumatic packaging machines**
- **Pneumatic conveyors**
- **Air operated production equipment**
- **Air operated lifts**

Safeguard your operations from rust, pipescale, water, and oil. The prefilters will remove contaminants at a very high efficiency - up to 93% for 0.01 micron particles and droplets. Liquid releases from the filter cartridge to an automatic drain as rapidly as it enters the filter. This allows the filter to continue removing liquids for an unlimited time without loss of efficiency or flow capacity.

The final stage of filtration removes all remaining contaminates with an efficiency rating of 99.99+% at 0.01 microns. Select 1/4” to 1 1/2” line filters are constructed of aluminum with a durable powder coating designed to hold up to the dirtiest compressed air systems.

The Parker Balston 2 stage filter systems offer the best protection to all your pneumatic equipment and instrumentation. These high efficiency filtration systems will eliminate costly maintenance and unexpected downtime due to contaminated compressed air.

Filters for the Food Industry

Balston 2000 Series

The Balston filter performance complies with several of the international standards as written in ISO8573-1 which is fast becoming the industry standard method for specifying compressed air purity. The following diagrams illustrate the various classes of purity that can be achieved by using the Balston grade DX filter media or BX media or a combination of both.

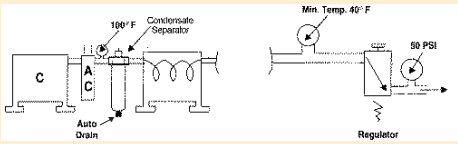
Explanation for 2 Stage Compressed Air Filter System

1st Stage: Grade DX	Removal of large quantities of oil, water, and dirt from compressed air. Prefilter to Grade BX
2nd Stage: Grade BX	Complete removal of trace quantities of oil, water, and dirt down to 0.01 microns.

Class	Solid			Water		Oil	
	Maximum Particle Size (micron)	Maximum Concentration ppm	(mg/m³)	Maximum Pressure Dewpoint °F	(°C)	Maximum Concentration ppm	(mg/m³)
1	0.1	.08	(0.1)	-94	(-70)	.008	(0.01)
2	1	.8	(1)	-40	(-40)	.08	(0.1)
3	5	4.2	(5)	-4	(-20)	.83	(1)
4	15	6.7	(8)	37	(+3)	4.2	(5)
5	40	8.3	(10)	45	(+7)	21	(25)
6	-	-	-	50	(+10)	-	-

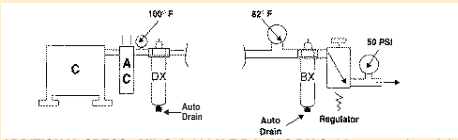
ISO Class Example **1** **Solid** **4** **Water** **1** **Oil**

ISO Class 1 4 1
Any compressor with aftercooler, 2-stage coalescing and refrigerated dryer for use with instrument quality air.



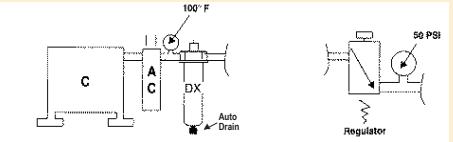
ADDITIONAL SPECS: CGA - G7.1 (Grade D & E) ISA S7.3, sFed. Std. 209 (Class 100)

ISO Class 1 1
Any compressor with aftercooler and 2-stage coalescing. Air intended for use as lubricated control valves, cylinders and parts blow-down.



ADDITIONAL SPECS: Mil. Std. 282 H.E.P.A., U.S.P.H.S. 3A accepted particles for milk.

ISO Class 2 2
Any compressor with aftercooler and coalescer. Air intended for use with lubricated air tools, air motors, cylinders, shot blasting, non-frictional valves.



ADDITIONAL SPECS: CGA - G7.1 (Grades A & Ba1)

Flow Rates

Filter Housing Model	Port Size	Filter Cartridge Grade	Flow rates SCFM (Nm³/hr), at 4 psi (0.27 bar) drop at indicated line pressure. Refer to Principal Specification Charts in each product data sheet for maximum pressure rating of each housing PSIG								
			2 (0.1)	20 (1.4)	40 (2.8)	80 (5.5)	100 (6.9)	125 (8.6)	150 (10)	200 (14)	250 (17)
2A-2002N-3B1	1/4"	DX	9 (15)	19 (32)	39 (66)	51 (87)	63 (107)	76 (129)	90 (153)	117 (199)	145 (246)
2A-2003N-3B1	3/8"	BX	3 (5)	8 (14)	11 (19)	21 (36)	25 (42)	31 (53)	36 (61)	47 (80)	58 (99)
2A-2004N-3B1											
2A-2104N-3B1	1/2"	DX	19 (32)	41 (70)	65 (110)	113 (192)	137 (233)	166 (282)	196 (333)	257 (437)	316 (537)
		BX	9 (15)	19 (32)	30 (51)	51 (87)	63 (107)	76 (129)	90 (153)	117 (199)	145 (246)
2A-2206N-3B1	3/4"	DX	37 (63)	78 (133)	123 (209)	214 (364)	259 (440)	315 (535)	371 (630)	484 (822)	596 (1013)
		BX	10 (17)	21 (36)	34 (58)	56 (95)	70 (119)	85 (144)	101 (172)	131 (223)	162 (275)
2A-2208N-3B1	1"	DX	55 (93)	115 (195)	181 (308)	314 (533)	380 (646)	463 (787)	546 (928)	711 (1208)	877 (1490)
		BX	11 (19)	23 (39)	37 (63)	64 (109)	77 (131)	94 (160)	111 (189)	144 (245)	178 (302)
2A-2312N-3B1	1 1/2"	DX	98 (167)	203 (345)	319 (542)	554 (941)	670 (1138)	816 (1386)	963 (1636)	1254 (2131)	1546 (2627)
		BX	22 (37)	46 (78)	74 (126)	129 (219)	155 (263)	189 (321)	223 (379)	290 (493)	358 (608)

Filters for the Food Industry

2A-2002N-3B1, 2A-2004N-3B1
2A-2003N-3B1

2A-2104N-3B1

2A-2206N-3B1, 2A-2208N-3B11

2A-2312N-3B1

Principal Specifications

Model	2A-2002, 2003, 2004	2A-2104	2A-2206	2A-2208	2A-2312
Port Size	1/4" NPT	1/2" NPT	3/4" NPT	1" NPT	1.5" NPT
Materials of Construction					
Head	Aluminum →				
Bowl	Aluminum →				
Internals	Aluminum →				
Seals	Buna-N Food Grade →				
Maximum Temperature (1)	130°F (54°C) →				
Maximum Pressure (2)	175 psig (12 barg) →				
Minimum Pressure (3)	15 psig (1 barg) →				
Shipping Weight	4.2 lbs. (1.9 kg)	5 lbs. (2.3 kg)	11.7 lbs. (5.3 kg)	11.7 lbs. (5.3 kg)	27 lbs. (12 kg)
Dimensions	6.25"W X 8.5"L	6.25"W X 11"L	8.3"W X 13"L	8.3"W X 13"L	10.5"W X 17"L

Notes:
1 Max. temperature with auto drain
2 Max. pressure with auto drain. Max. pressure with manual drain is 250 psi (17 barg).
3 Required for proper operation of auto drain.

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

Assembly Ordering Information

Model P/N		Replacement Cartridge Box of 5	Replacement Cartridge Box of 10
2A-2002N-3B1	1/4" 2-Stage (DX, BX) Filter Assembly	5/100-12-DX	100-12-DX
2A-2003N-3B1	3/8" 2-Stage (DX, BX) Filter Assembly	5/100-12-BX	100-12-BX
2A-2004N-3B1	1/2" 2-Stage (DX, BX) Filter Assembly		
2A-2104N-3B1	1/2" 2-Stage (DX, BX) Filter Assembly	5/100-18-DX 5/100-18-BX	100-18-DX 100-18-BX
2A-2206N-3B1	3/4" 2-Stage (DX, BX) Filter Assembly	5/150-19-DX 5/150-19-BX 5/150-19-SA	150-19-DX 150-19-BX
2A-2208N-3B1	1" 2-Stage (DX, BX) Stainless Assembly	5/150-19-DX 5/150-19-BX 5/150-19-SA	150-19-DX 150-19-BX
2A-2312N-3B1	1" 2-Stage (DX, BX) Stainless Assembly	5/200-35-DX 5/200-35-BX	200-35-DX 200-35-BX

4 2 each of mounting brackets are required for adequate support.
5 For CRN rated assemblies add a "C" to the Model Number. Example: 2A-C2104N-3B1

Filters for the Food Industry

CAMTU Compressed Air Microbial Test Unit

Identify Sources of Contamination in Compressed Air and Improve Food Safety

Compressed air is used in a broad range of applications in the food processing industry, such as mixing of ingredients, cutting, sparging, drying of product, transporting/propelling product through processing systems and packaging of final product. In many of these applications, compressed air is in direct contact or indirect contact with food product. The impurities in the compressed air may contaminate the food product which can result in change of color and taste, reduced shelf life, in addition to exposure to bacteria and other micro-organisms, can result in product recalls.

Compressed air is warm, dark and contains moisture which is the ideal environment to promote the production of microbes. These microbes migrate through the entire compressed air system and are released at exit points, critical areas that food, packaging or surface areas come in direct contact.

Recently, Safe Quality Foods (SQF) released a 7th edition amendment in sections 10.5.7 and 11.7.5 stating, compressed air used in the manufacturing process shall be clean and present no risk to food safety. Others have also identified compressed air as a source of contamination and risk to food safety.

Product Features:

- **Lightweight and ergonomically designed for ease of use**
- **Constructed of durable polypropylene - easily sanitized**
- **Pre-filled petri dishes with specialized tryptic soy agar designed to hold up to compressed air flow/pressure**
- **No electrical supply required**
- **No refrigeration required for the petri dishes – 300 day shelf life**
- **Quick sampling time – 20 seconds**
- **Complete kit with connection tubing, pressure regulator/metering orifice, shut off valve, timer and petri dishes**

Filters for the Food Industry

CAMTU Compressed Air Microbial Test Unit

British Compressed Air Society has produced a specification for dewpoint (-40F/C), oil removal <0.01mg/m3 and particulate removal (including micro-biological particles) 0.1-0.5 microns. Request white paper by Lee Scott, “Reducing Contamination Risks of Compressed Air in Food Plants”.

However, to date, the only devices capable of sampling compressed air systems for microbes are expensive, very cumbersome, require lengthy sampling times and require extensive training. Parker Balston recognized the need for an alternative device that is easily transported throughout the food plant and can provide a quick qualitative analysis of compressed air purity requiring very little training.

The Parker Balston CAMTU (compressed air microbial test unit) is easily transported weighing less than a pound. It comes complete with connection tubing, shut off valve and a special designed pressure regulator and metering orifice. These matched components provide the exact amount of compressed air exposure for each sampling. The petri dishes are filled with specialized tryptic soy agar designed to hold up to compressed air flow and pressure. TSA is used for the cultivation of a wide variety of microorganisms including most bacteria and mold spores.

The Parker Balston CAMTU has been validated by Dr. Mclandsborough, head of the Food Science Department of the University of Massachusetts, Amherst MA. —request white paper, “Comparison of the Compressed Air Microbial Testing Unit (CAMTU) to a standard method of bioaerosol sampling.”

To obtain a sample, simply plug the connection tubing into the sample point on the compressed air system, insert a petri dish into the CAMTU, close the CAMTU, open the shutoff valve and expose the agar for 20 seconds. After exposure simply place the petri dish in an incubator for 48 hours or in a controlled environment of at least 68°F and observe for colony forming units (CFUs).

This is an ideal device to incorporate into your Good Manufacturing Practices program for monitoring all the identified HACCP risk points. For those risk points where microbes are discovered, we would recommend installing Balston 3 stage sterile air systems which will remove oil, water, rust, pipescale and all microbes from the compressed air (Request literature bulletin FMB09. The CAMTU can then be used to monitor those filter systems for optimum performance.

Filters for the Food Industry

CAMTU Compressed Air Microbial Test Unit

CAMTU Sampling System

Filters for the Food Industry

CAMTU Compressed Air Microbial Test Unit

Storage and Carrying Case

Principal Specifications and Ordering Information

Complete Kit: C01-0128	
CAMTU Sampling Device	CO1-0122
DFU Assembly	CO2-2418
Timer device	CO1-0123
Tubing ¼" OD	A01-0459
Regulator/Metering Assembly	CO1-0125
Sanitizing spray bottle	CO1-0124
Shut off valve	CO1-0126
Petri dishes (20 each)	CO1-0127
Dimensions	15.63"w x 13.63"h x 6.38"d (40cm x 35cm x 16cm)
Shipping Weight	7 lbs. (3.2 kg)

Filters for the Food Industry

Balston 3 Stage Sterile Air Filter Systems

Safeguard your operations from rust, pipescale, water, oil, and organisms. The prefilters will remove contaminants at a very high efficiency - up to 99.99% for 0.01 micron particles and droplets. Liquid releases from the filter cartridge to an automatic drain as rapidly as it enters the filter. This allows the filter to continue removing liquids for an unlimited time without loss of efficiency or flow capacity.

The final stage of filtration removes all viable organisms with an efficiency rating of 99.9999+% at 0.01 microns. Select 1/4" to 1 1/2" aluminum with a durable powder coating designed to hold up to the dirtiest compressed air systems.

Product Features:

- **Remove all viable organisms - at 99.9999+% @0.01 microns**
- **Remove 99.99% of 0.01 micron particles of oil, water, and dirt from compressed air and other gases**
- **Low pressure drop**
- **Continuously trap and drain liquids**

The Application:

Compressed air is contaminated with compressor oil, water condensate, pipe scale and rust all of which provide the ideal environment and means to grow bacteria. This natural occurring contaminate can also effect the taste, appearance and shelf life of food product. The food processing and packaging industry utilizes compressed air extensively throughout their facilities. Compressed air is used to push and propel product, cut and mix product in addition to packaging product.

Cahoon Farms in Walcott, New York uses Parker Balston three stage filtration systems for all their compressed air and sterile air applications. Cahoon Farms packages fresh sliced apples and cherries, dried apples, and other assorted dried fruits. Compressed air is used extensively throughout the facility servicing pneumatic equipment, slicing and mixing food product, and packaging. The sterile compressed air applications are filtered to an efficiency of 99.9999+% at 0.01 microns, which is 30 times better than the accepted industry standard. Cahoon Farms safeguards their food product from any possible contamination that could lead to bacteria and mold growth. The investment in these filtration systems ensures Cahoon Farms' products will maintain superior taste, quality and freshness with an extended shelf life.

Filters for the Food Industry

Sterile Air Filter Rating Information

Balston grade SA filter cartridges, rated at 99.9999+% efficiency for 0.01 micron particles, is at least 30 times better than the accepted standard for sterile air filters developed by independent research organizations in the U.S. and U.K. (request bulletin TI-105 for a detailed discussion on Balston filter efficiency rating procedure, and Bulletin TI-935 for an independent test report on Balston Sterile Air Filters). Balston Sterile Air Filters are in full compliance with the requirements of the FDA.

Explanation for 3 Stage Sterile Air System

1st Stage: Grade DX	Removal of large quantities of oil, water, and dirt from compressed air. Prefilter to Grade BX
2nd Stage: Grade BX	Complete removal of trace quantities of oil, water, and dirt down to 0.01 microns.
3rd Stage: Grade SA	Removal of bacteria providing sterile air.

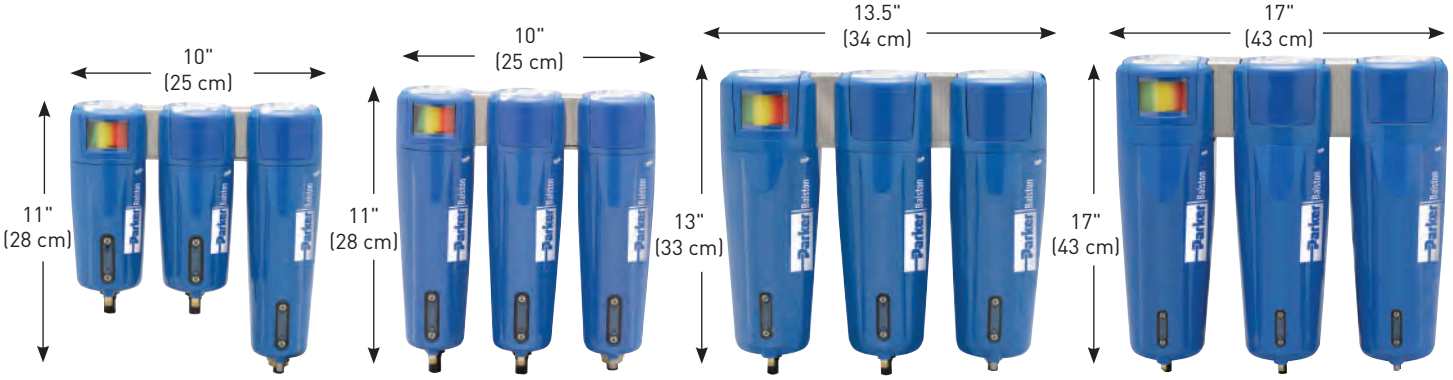
Flow Rates

Filter Housing Model	Port Size	Filter Cartridge Grade	Flow rates SCFM (Nm^3/hr), at 7 psi (0.48 bar) drop at indicated line pressure. Refer to Principal Specification Charts in each product data sheet for maximum pressure rating of each housing PSIG						
			2 (0.1)	20 (1.4)	40 (2.8)	80 (5.5)	100 (6.9)	125 (8.6)	150 (10)
3B-2002N-3B1	1/4”	DX	9 (15)	19 (32)	39 (87)	51 (107)	63 (107)	76 (129)	90 (153)
3B-2003N-3B1	3/8"	BX	3 (5)	8 (14)	11 (36)	21 (42)	25 (42)	31 (53)	36 (61)
3B-2004N-3B1	1/2”	SA	---	8 (14)	11 (36)	21 (42)	25 (42)	31 (53)	36 (61)
3B-2104N-3B1	1/2”	DX	19 (32)	41 (70)	65 (192)	113 (233)	137 (233)	166 (282)	196 (333)
		BX	9 (15)	19 (32)	30 (87)	51 (107)	63 (107)	76 (129)	90 (153)
		SA	---	19 (32)	30 (87)	51 (107)	63 (107)	76 (129)	90 (153)
3B-2206N-3B1	3/4”	DX	37 (63)	78 (133)	123 (364)	214 (440)	259 (440)	315 (535)	371 (630)
		BX	10 (17)	21 (36)	34 (95)	56 (119)	70 (119)	85 (144)	101 (172)
		SA	---	21 (36)	34 (95)	56 (119)	70 (119)	85 (144)	101 (172)
3B-2208N-3B1	1”	DX	55 (93)	115 (195)	181 (533)	314 (646)	380 (646)	463 (787)	546 (928)
		BX	11 (19)	23 (39)	37 (109)	64 (131)	77 (131)	94 (160)	111 (189)
		SA	---	23 (39)	37 (109)	64 (131)	77 (131)	94 (160)	111 (189)
3B-2312N-3B1	1 1/2”	DX	98 (167)	203 (345)	319 (941)	554 (1138)	670 (1138)	816 (1386)	963 (1636)
		BX	22 (37)	46 (78)	74 (219)	129 (263)	155 (263)	189 (321)	223 (379)
		SA	16 (27)	33 (56)	52 (155)	91 (187)	110 (187)	134 (228)	158 (223)

1 For CRN rated assemblies add a "C" to the Model Number. Example: 3B-C2104N-3B1

Filters for the Food Industry

3 Stage Sterile Air Filter Systems



3B-2002N-3B1, 3B-2004N-3B1
3B-2003N

3B-2104N-3B1

3B-2206N-3B1, 3B-2208N-3B1

3B-2312N-3B1

Principal Specifications

Model	3B-2002, 2003, 2004	3B-2104	3B-2206	3B-2208	3B-2312
Port Size	1/4" NPT	1/2" NPT	3/4" NPT	1" NPT	1.5" NPT
Materials of Construction					
Head	Aluminum →				
Bowl	Aluminum →				
Internals	Aluminum →				
Seals	Buna-N Food Grade →				
Maximum Temperature (1)	130°F (54°C) →				
Maximum Pressure (2)	175 psig (12 barg) →				
Minimum Pressure (3)	15 psig (1 barg) →				
Shipping Weight	6.75 lbs. (3.1 kg)	7.5 lbs. (3.4 kg)	17.5 lbs. (8.0 kg)	17.5 lbs. 8.0 kg)	41.25 lbs. (18.8 kg)
Dimensions	10"W X 11"L	10"W X 11"L	13.5"W X 13"L	13"W X 13"L	17"W X 17"L

Notes:
1 Max. temperature with auto drain
2 Max. pressure with auto drain. Max. pressure with manual drain is 250 psig (17 barg).
3 Required for proper operation of auto drain.

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

Assembly Ordering Information

Model P/N		Replacement Cartridge Box of 5	Replacement Cartridge Box of 10
3B-2002N-3B1	1/4" 3-Stage (DX, BX, SA) Filter Assembly	5/100-12-DX	100-12-DX
3B-2003N-3B1	3/8" 3-Stage (DX, BX, SA) Filter Assembly	5/100-12-BX	100-12-BX
3B-2004N-3B1	1/2" 3-Stage (DX, BX, SA) Filter Assembly	5/100-12-SA	100-12-SA
3B-2104N-3B1	1/2" 3-Stage (DX, BX, SA) Filter Assembly	5/100-18-DX	100-18-DX
		5/100-18-BX	100-18-BX
		5/100-18-SA	100-18-SA
3B-2206N-3B1	3/4" 3-Stage (DX, BX, SA) Filter Assembly	5/150-19-DX	150-19-DX
		5/150-19-BX	150-19-BX
		5/150-19-SA	150-19-SA
3B-2208N-3B1	1" 3-Stage (DX, BX, SA) Stainless Assembly	5/150-19-DX	150-19-DX
		5/150-19-BX	150-19-BX
		5/150-19-SA	150-19-SA
3B-2312N-3B1	1 1/2" 3-Stage (DX, BX, SA) Stainless Assembly	5/200-35-DX	200-35-DX
		5/200-35-BX	200-35-BX
		5/200-35-SA	200-35-SA

4 2 each of mounting brackets are required for adequate support.

Filters for the Food Industry

3 Stage Sterile Air Filter Systems

Balston Stainless Steel Compressed Air Filter Assemblies

Safeguard your operations from rust, pipescale, water, oil, and organisms. These filters will remove contaminants at a very high efficiency - up to 99.99% for 0.01 micron particles and droplets. Liquid releases from the filter cartridge to an automatic drain as rapidly as it enters the filter. This allows the filter to continue removing liquids for an unlimited time without loss of efficiency or flow capacity.

The final stage of filtration removes all viable organisms with an efficiency rating of 99.9999+ at 0.01 microns. Select 1/4" to 1" line filters are constructed of 304 stainless steel and are designed to hold up to the harshest environments.

Product Features

- **All 304 stainless steel construction, ideal standing up to aggressive washdown chemicals**
- **Low pressure drop**
- **Remove 99.9999+% of 0.01 micron particles of oil, water, and dirt from compressed air and other gases**
- **Remove all viable organisms**
- **Full compliance with FDA requirements**
- **USDA/FSIS accepted for use in federally inspected meat and poulty plants**
- **Continuously trap and drain liquids**

The Application

Compressed air is contaminated with compressor oil, water condensate, pipe scale and rust all of which provide the ideal environment and means to grow bacteria. This natural occurring contaminate can also effect the taste, appearance and shelf life of food product. The food processing and packaging industry utilizes compressed air extensively throughout their facilities. Compressed air is used to push and propel product, cut and mix product in addition to packaging product.

Cahoon Farms in Walcott, New York uses Parker Balston three stage filtration systems for all their compressed air and sterile air applications. Cahoon Farms packages fresh sliced apples and cherries, dried apples, and other assorted dried fruits. Compressed air is used extensively throughout the facility servicing pneumatic equipment, slicing and mixing food product, and packaging. The sterile compressed air applications are filtered to an efficiency of 99.9999+% at 0.01 microns which is 30 times better than the accepted industry standard. Cahoon Farms safeguards their food product from any possible contamination that could lead to bacteria and mold growth. The investment in these filtration systems ensures Cahoon Farms' products will maintain superior taste, quality and freshness with an extended shelf life.

Filters for the Food Industry

3 Stage Sterile Air Filter Systems

Sterile Air Filter Rating Information

Balston grade SA filter cartridges, rated at 99.9999+% efficiency for 0.01 micron particles, is at least 30 times better than the accepted standard for sterile air filters developed by independent research organizations in the U.S. and U.K. (request bulletin TI-105 for a detailed discussion on Balston filter efficeincy rating procedure, and Bulletin TI-935 for an independent test report on Balston Sterile Air Filters). Balston Sterile Air Filters are in full compliance with the requirements of the FDA.

Explanation for 3 Stage Sterile Air System

1st Stage: Grade DX	Removal of large quantities of oil, water, and dirt from compressed air. Prefilter to Grade BX
2nd Stage: Grade BX	Complete removal of trace quantities of oil, water, and dirt down to 0.01 microns.
3rd Stage: Grade SA	Removal of bacteria providing sterile air.

Steam Sterilization Procedure

In installations where the sterile air filter requires steam sterilization, we recommend the following procedures:

The steam sterilization pressure should not exceed 60 psig (4.1 barg). Preferably, it should be held to 40 psig (2.8 barg) or less. A typical sterilization cycle is 30 psig (2.1 barg) steam for 30 minutes. Steaming time can be increased as desired without harm to the filter cartridges. The steam flow should not exceed the normal air flow for the unit. To ensure no buildup of condensate in the housing, condensate should be drained from the filter by a condensate drain valve during the steaming process. The cleanliness of the steam is an important factor influencing the life of the sterile air filter cartridges. Parker strongly recommends using model 23 steam filters to ensure optimum operating life. When autoclaving, the grade SA filter cartridges will tolerate temperatures to 300°F (149°C) in dry gas. Viton or other heat resistant seals should be used in the housing.

Flow Rates

Filter Housing Model	Port Size	Filter Cartridge Grade	Flow rates SCFM (Nm³/hr), at 7 psi (0.48 bar) drop at indicated line pressure. Refer to Principal Specification Charts in each product data sheet for maximum pressure rating of each housing PSIG								
			2	20	40	80	100	125	150	200	250
3B-6002N-0A1	1/4"	DX	9 (15)	19 (32)	39 (66)	51 (87)	63 (107)	76 (129)	90 (153)	117 (199)	145 (246)
3B-6904N-0A1	1/2"	BX	3 (5)	8 (14)	11 (19)	21 (36)	25 (42)	31 (53)	36 (61)	47 (80)	58 (99)
		SA	---	8 (14)	11 (19)	21 (36)	25 (42)	31 (53)	36 (61)	---	---
3B-6004N-0A1	1/2"	DX	19 (32)	41 (70)	65 (110)	113 (192)	137 (233)	166 (282)	196 (333)	257 (437)	316 (537)
		BX	9 (15)	19 (32)	30 (51)	51 (87)	63 (107)	76 (129)	90 (153)	117 (199)	145 (246)
		SA	---	19 (32)	30 (51)	51 (87)	63 (107)	76 (129)	90 (153)	---	---
3B-6006N-0A1	3/4"	DX	37 (63)	78 (133)	123 (209)	214 (364)	259 (440)	315 (535)	371 (630)	484 (822)	596 (1013)
		BX	10 (17)	21 (36)	34 (58)	56 (95)	70 (119)	85 (144)	101 (172)	131 (223)	162 (275)
		SA	---	21 (36)	34 (58)	56 (95)	70 (119)	85 (144)	101 (172)	---	---
3B-6008N-0A1	1"	DX	55 (93)	115 (195)	181 (308)	314 (533)	380 (646)	463 (787)	546 (928)	711 (1208)	877 (1490)
		BX	11 (19)	23 (39)	37 (63)	64 (109)	77 (131)	94 (160)	111 (189)	144 (245)	178 (302)
		SA	---	23 (39)	37 (63)	64 (109)	77 (131)	94 (160)	111 (189)	---	---

Filters for the Food Industry

3 Stage Sterile Air Filter Systems

3B-6002N-0A1
3B-6904N-0A1

3B-6004N-0A1

3B-6006N-0A1

3B-6008N-0A1

Principal Specifications

Model	3B-6002	3B-6904	3B-6004	3B-6006	3B-6008
Port Size	1/4" NPT	1/2" NPT	1/2" NPT	3/4" NPT	1" NPT
Materials of Construction					
Head	304 Stainless Steel	→	→	→	→
Bowl	304 Stainless Steel	→	→	→	→
Internals	Stainless Steel				
Seals	Buna-N Food Grade	→	→	→	→
Maximum Temperature (1)	120°F (49°C)	→	→	→	→
Maximum Pressure (2)	175 psig (12 barg)	→	→	→	→
Minimum Pressure (3)	15 psig (1 barg)	→	→	→	→
Shipping Weight	10.5 lbs. (4.77 kg)	10.5 lbs. (4.77 kg)	11.8 lbs. (5.4 kg)	33.7 lbs. (15.3 kg)	34 lbs. (15.5 kg)
Dimensions	9"W X 3"D X 8"L	9"W X 3"D X 8"L	9"W X 3"D X 8"L	13"W X 4"D X 11"L	13"W X 4"D X 12"L

Notes:
1 Max. temperature with auto drain Max. temperature with manual drain is 275°F (135°C).
2 Max. pressure with auto drain. Max. pressure with manual drain is 250 psi (17 bar).
3 Required for proper operation of auto drain.

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

Assembly Ordering Information

Model P/N	Mounting Bracket (stainless steel)	Replacement Cartridge Box of 5	Replacement Cartridge Box of 10	Mounting Bracket (stainless steel) (4)
3B-6002N-0A1	1/4" 3-Stage (DX, BX, SA) Stainless Filter Assembly	5/100-12-DX 5/100-12-BX 5/100-12-SA	100-12-DX 100-12-BX 100-12-SA	C01-0094
3B-6904N-0A1	1/2" 3-Stage (DX, BX, SA) Stainless Filter Assembly	5/100-12-DX 5/100-12-BX 5/100-12-SA	100-12-DX 100-12-BX 100-12-SA	C01-0094
3B-6004N-0A1	1/2" 3-Stage (DX, BX, SA) Stainless Filter Assembly	5/100-18-DX 5/100-18-BX 5/100-18-SA	100-18-DX 100-18-BX 100-18-SA	C01-0094
3B-6006N-0A1	3/4" 3-Stage (DX, BX, SA) Stainless Filter Assembly	5/200-176-DX 5/200-176-BX 5/200-176-SA	200-176-DX 200-176-BX 200-176-SA	C01-0094
3B-6008N-0A1	1" 3-Stage (DX, BX, SA) Stainless Filter Assembly	5/200-185-DX 5/200-185-BX 5/200-185-SA	200-185-DX 200-185-BX 200-185-SA	C01-0094

4 Two each of mounting brackets are required for adequate support.

Filters for the Food Industry

Sterile Air Filters

Remove all viable organisms

USDA/FSIS accepted for use in federally inspected Meat and Poultry plants

Low pressure drop

Full compliance with FDA requirements

Model 200X Series

Model 2104 Series

Model 2206, 2208

Model 2312

Model A15/80

Balston® Sterile Air Filters

Balston grade SA filter cartridges, rated at 99.9999+% efficiency for 0.01 micron particles, is at least 30 times better than the accepted standard for sterile air filters developed by independent research organizations in the U.S. and U.K. (request Bulletin TI-105 for a detailed discussion on Balston filter efficiency rating procedure, and Bulletin TI-935 for an independent test report on Balston Sterile Air Filters). Balston Sterile Air Filters are in full compliance with the requirements of the FDA.

Here's what one of your colleagues found:

A Balston sterile air filter assembly, consisting of Models 200X Series, was tested at the University of Massachusetts, Department of Food Science and Nutrition, under the direction of Professor David A. Evans, Ph.D.

"This sterile air system produced commercially sterile air and, to the limits of detection, no viable colonies of microorganisms were found".

- Professor David A. Evans, Ph.D.

Filters for the Food Industry

Sterile Air Filters

Filter Cartridge Description

1st Stage: Grade DX	2nd Stage: Grade BX	3rd Stage: Grade SA
For removal of large quantities of oil, water, and dirt from compressed air. Prefilter to Grade BX.	For complete removal of trace quantities of oil, water, and dirt.	For removal of bacteria when providing sterile air.

Physical Properties, Microfibre Filter Cartridges

Temperature Range	-150°F to 300°F (-100°C - 149°C)
Maximum Pressure	100 psi (6.9 bar), 60 psi (4 bar) for Grade SA Filter Differential Across Filter, Tubes
Inside-to-Outside Flow:	
Materials of Construction fluorocarbon resin binder.	Borosilicate glass microfibers with Resistant to water, all hydrocarbon and synthetic lubricants.

Retention Efficiency

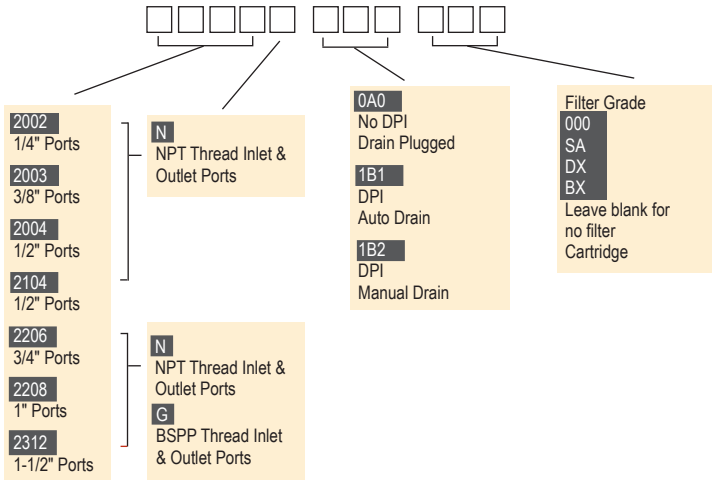
Grade	Efficiency for 0.01 Micron Particles and Droplets
DX	93% @ 0.01 µm
BX	99.99% @ 0.01 µm
SA	99.9999+% @ 0.01 µm

Balston Filter Cartridge and Housing Selection

Balston provides two grades of coalescing filter cartridges, Grade DX and Grade BX. Singly or in tandem, these filters satisfy all requirements for removing liquid and solid contaminants from compressed air. These filters are recommended as prefilters in sterile air systems. The Balston Grade SA filter removes bacteria from compressed air. It is the final filter in a sterile air system.

How to Select the Filter Cartridge and Housing

1. Decide which grade(s) of filter cartridges fits the application (see selection boxes at left).
2. Select the filter housing with a port size equal to the line size where the filter is to be located.
3. For a new installation in which the line size has yet to be selected, determine the gas flow rate and pressure at the point where the filter will be located, and then refer to the flow chart on the reverse side of this data sheet. The filter port size must be equal to or larger than the line size (when specified).
4. If the sterile air filter assembly requires steam sterilization, stainless steel filter assemblies specifically designed for in-line steam sterilization must be used. These assemblies are identified by the RED print in the flow chart on the next page.



How to Order the Filter Assembly

1. Build your own custom filter assembly using the guideline matrix to the left and specify your model number. Example: 1/2" filter with DPI and Auto Drain with Grade DX Filter = 2104N-1B1-DX.
2. Each assembly is shipped with the filter cartridge installed. To order additional filter cartridges, indicate the model number of the cartridges, and the grade. Examples 100-12-DX, 100-12-BX, or 100-12-SA, etc.

Filters for the Food Industry

Sterile Air Filters

Steam Sterilization Procedure

In installations where the sterile air filter requires steam sterilization, we recommend the following procedures:

The steam sterilization pressure should not exceed 60 psig. Preferably, it should be held to 40 psig (2.8 barg) or less. A typical sterilization cycle is 30 psig (2.1 barg) steam for 30 minutes. Steaming time can be increased as desired without harm to the filter cartridges. The steam flow should not exceed the normal air flow for the unit. To ensure no buildup of condensate in the housing, condensate should be drained from the filter by a condensate drain valve during the steaming process.

The cleanliness of the steam is an important factor influencing the life of the Sterile Air Filter cartridges. Parker strongly recommends using Model 23 Steam Filters to ensure optimum operating life (see steam filter section of this literature pack).

When autoclaving, the Grade SA filter cartridges will tolerate temperatures to 300°F (149°C) in dry gas. Viton or other heat resistant seals should be used in the housing.

Filter Assemblies Assemblies in BLUE are Steam Sterilization			Flow rates SCFM (NM^3/hr), at 7 psi (0.48 bar) drop at indicated line pressure (over 3 stages) Refer to Principal Specification Charts in each product data sheet for maximum Recommended for pressure rating of each housing							
1st Stage	**2nd Stage**	**3rd Stage**	**Port Size**	**20**	**40**	**60**	**80**	**100**	**125**	**150**
2002N-1B1-DX	2002N-1B1-BX	2002N-OAO-SA A33B-SA	1/4"	8 (14)	11 (19)	16 (27)	21 (36)	25 (42)	31 (53)	36 (61)
2104N-1B1-DX	2104N-1B1-BX	2104N-OAO-SA A45B-SA	1/2"	19 (32)	30 (51)	41 (70)	51 (87)	63 (107)	76 (129)	90 (153)
2208N-1B1-DX	2208N-1B1-BX	2208N-OAO-SA A27/35B-SA	1"	23 (39)	37 (63)	50 (85)	64 (109)	77 (131)	94 (160)	111 (189)
2312N-1B1-DX	2312N-1B1-BX	2312N-OAO-SA A27/80B-SA (1)	1 1/2"	46 (78)	74 (126)	101 (172)	129 (219)	155 (263)	189 (321)	223 (379)
A15/80-DX	A15/80-BX	A15/80-SA A15/80S6-SA	2"	94 (160)	148 (251)	202 (343)	256 (435)	310 (527)	378 (642)	445 (756)
AFF3-0128-HFC	AFF3-0128-HEC	AKC-0280-SA AKSB-0280-SA	3"	190 (323)	300 (510)	400 (680)	510 (866)	620 (1053)	755 (1283)	890 (1512)
AFF4-0125-HFC	AFF4-0125-HEC	AKC-0480-SA AKSB-0480-SA	4"	380 (646)	590 (1002)	810 (1376)	1020 (1733)	1240 (2107)	1510 (2565)	1780 (3024)
AFF6-0136-HFC	AFF6-0136-HEC	AKC-0880-SA AKSB-0880-SA	6"	750 (1274)	1180 (2005)	1620 (2752)	2050 (3483)	2480 (4214)	3020 (5131)	3560 (6048)
AFF8-0428-HFC	AFF8-0428-HEC	AKC-1480-SA AKSB-1480-SA	8"	1310 (2226)	2070 (3517)	2830 (4808)	3580 (6082)	4340 (7374)	5300 (9005)	6230 (10585)
AFF10-0728-HFC	AFF10-0728-HEC	AKC-2280-SA AKSB-2280-SA	10"	2070 (3517)	3270 (5556)	4460 (7578)	5660 (9616)	6850 (11638)	8340 (14170)	9840 (16718)

Notes:
1 Two Type A27/80B-SA in parallel required.

Filters for the Food Industry

Sterile Air Filters - 1/4" to 2" Line Size

Principal Specifications

Model	2002,2003,2004 (5)	2104 (5)	2206 (5)	2208 (5)	2312 (5)	A15/80
Port Size	1/4",3/8",1/2" NPT	1/2" NPT	3/4" NPT	1" NPT	1 1/2" NPT	2" NPT
Maximum Pressure	250 psig (17 barg) (1)	250 psig (17 barg) (1)	250 psig (17 barg) (1)	250 psig (17 barg) (1)	250 psig (17 barg) (1)	250 psig (17 barg) (1)
Maximum Temperature	170°F (77°C)	170°F (77°C)	130°F (54°C)	130°F (54°C)	130°F (54°C)	130°F (54°C)
Materials of Construction						
Head	Anod. Alum.	Anod. Alum.	Anod. Alum.	Anod. Alum.	Anod. Alum.	Anod. Alum.
Bowl	Anod. Alum.	Anod. Alum.	Anod. Alum.	Anod. Alum.	Anod. Alum.	Steel
Internals	Nylon	Nylon	Aluminum	Aluminum	Aluminum	St. Steel
Seals	Buna-N	Buna-N	Buna-N	Buna-N	Buna-N	Buna-N
Shipping Weight	2 lbs. (0.9 kg)	2.5 lbs. (1 kg)	8 lbs. (3.6 kg)	8 lbs. (3.6 kg)	15 lbs. (6.8 kg)	11 lbs. (5 kg)
Dimensions	3.3"W X 8.5"L (8cm X 22cm)	3.3"W X 11.3"L (8cm X 28cm)	4"W X 13"L (10cm X 33cm)	4"W X 13"L (10cm X 33cm)	5.0"W X 17"L (13cm X 43cm)	6.3"W X 28"L (16cm X 71cm)

Ordering Information

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

Model	2002,2003,2004 (5)	2104 (5)	2206 (5)	2208 (5)	2312 5)	A15/80
Assembly with Grade DX Filter Cartridge	200?-1B1-DX	2104N-1B1-DX	2206N-1B1-DX	2208N-1B1-DX	2312N-1B1-DX	A15/80-DX
Assembly with Grade BX Filter Cartridge	200?-1B1-BX	2104N-1B1-BX	2206N-1B1-BX	2208N-1B1-BX	2312N-1B1-BX	A15/80-BX
Assembly with Grade SA Filter Cartridge & Support Core	200?-OAO-SA	2104N-OAO-SA	2206N-OAO-SA	2208N-OAO-SA	2312N-OAO-SA	A15/80-SA
Differential Pressure Indicator (optional)	Included (2)	Included (2)	Included (2)	Included (2)	Included (2)	Included (2)
Filter Cartridges (3)						
Number Required	1	1	1	1	1	1
Box of 3 (4)	3/100-12-❑	3/100-18-❑	3/150-19-❑	3/150-19-❑	3/200-35-❑	3/200-80-❑
Box of 5 (4)	5/100-12-❑	5/100-18-❑	5/150-19-❑	5/150-19-❑	5/200-35-❑	5/200-80-❑
Box of 10 (4)	100-12-❑	100-18-❑	150-19-❑	150-19-❑	200-35-❑	200-80-❑

Notes:

1 Maximum pressure ratings are for temperatures to 130°F (54°C). Please consult factory for maximum pressure ratings at elevated temperatures.

2 Differential Pressure Indicator is not supplied with assemblies containing Grade SA Cartridges. Maximum pressure rating for 41-082 is 250 psig (17 barg). The DPI is sensitive in the range of 0-5 psi (0-0.34 bar) differential.

3 To order filter cartridges, indicate the grade of filter cartridge by placing the appropriate letter after the ordering number. Examples: 5/100-12-DX, 100-18-BX, 150-19-SA.

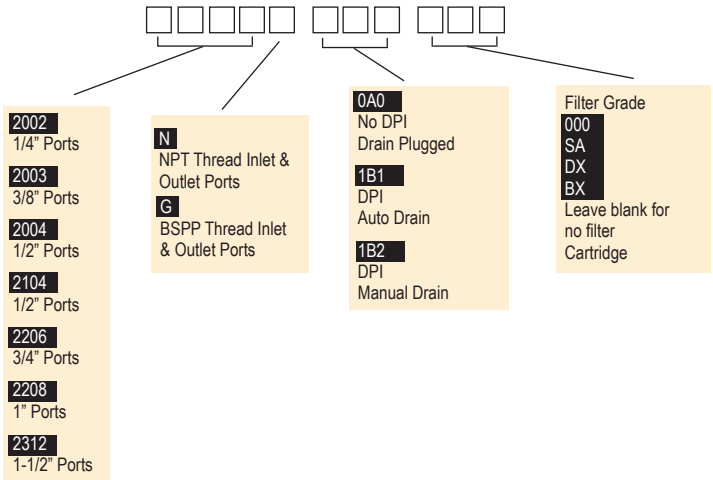
4 Grades BX, DX are available only in boxes of 5 and 10. Grade SA is available in boxes of 3 and 10.

5 Lifetime (20 year) warranty included. Contact your local representative for details.

How to Order the Filter Assembly*

Build your own custom filter assembly using the guideline matrix below and specify your model number. Example: 1/2" filter with DPI and Auto Drain with Grade DX Filter = 2104N-1B1-DX.

***Consult Factory. Not all configurations are available.**



Filters for the Food Industry

3” to 10” Line Size Filters

New LF/FF Series Multiple Cartridge Filter Assemblies

These filter assemblies provide high efficiency filtration of compressed air and other compressed gases at very high flow rates. With inlet and outlet ports accommodating 3” to 10” pipe sizes, the new LF/FF Series housings are capable of flow rates up to a maximum capacity of 37,350 SCFM (63,458 m^3/h) at 100 psig (6.9 barg). The standard carbon steel units, which are generally in stock (through 6” line sizes), have pressure ratings up to 250 psig (17.2 barg).

All LF/FF series housings are ASME Code Stamped for the rated maximum operating pressure. All FF Series vessels have built-in legs for floor mounting. Selected models have swing bolt enclosures for easy access to the internals. The filter cartridges in all models are sealed by tightening the threaded retainer cap onto the rigid tie rod, ensuring a leak tight seal on both ends of the cartridge.

Each assembly is equipped with a carbon steel automatic float drain, differential pressure indicator, and a set of filter cartridges (except where noted).

Benefits

- ***Low Pressure Drop***
- ***Lower Change out/Labor Costs***
- ***Lower Energy Costs***
- ***High Dirt Holding Capacity***
- ***Heat and Chemical Resistant***
- ***No Wet Zone***
- ***Oleophobic/Hydrophobic***
- ***High Burst Strength***

Calculation with Part-Load Operation (100 hp compressor)

Annual Electricity Costs =
[(Motor full-load brake horsepower) x (0.746 kW/hp)
x (Annual Hours of Operation) x (Electricity Cost in $/kWh)] x [(Percent of time running fully loaded) + (0.30) x (Percent of time running unloaded)]
For example:
Full load motor efficiency = 90%
Motor full load bhp = 100 hp
Annual hours of operation = 8,760 hours (3-shift, continuous operation)
Runs 65% of the time fully loaded, 35% of the time unloaded
Unloaded operation consumes 30 percent of the electricity of fully loaded operation
Cost of electricity = $0.10/kWh
Annual electricity costs =
[(100 hp) x (0.746 hp/kW) x (8,760 hrs) x $0.10/kWh) / 0.9] x [0.65 + (0.30) x (0.35)] = **$54,272.00**

Filters for the Food Industry

3” to 10” Line Size Filters

HFC Savings

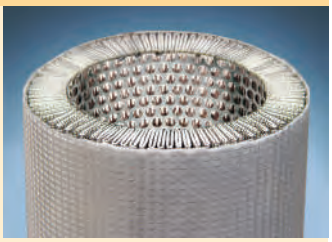
Annual electricity costs to operate a 100 HP Compressor can be as high as $50,000. Pressure loss in the system adds to this expense. For a system operating at 100 psig (7 barg) that loses 2 psig (0.14 barg) of pressure through a filter, requires an additional 1% in operating energy costs (1).

Installing a single stage HFC Filter in place of a standard brand X filter, will reduce the pressure drop by 2+ psi (0.14 barg).

Based on a standard 100 HP (74.6 kW) compressor operating at a 65% load cycle, a 1% reduction in annual operating costs would be equal to $542.00

NEW!

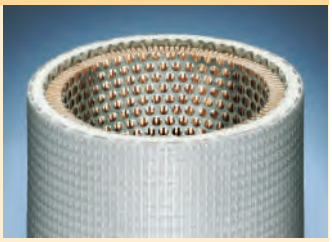
High Flow Coalescing Filter Media HFC Grade



Efficiency: 99.5% @ 0.5 micron

Balston’s HFC media consists of two layers. The outer layer features a dense matrix of glass fibers. It provides highly efficient coalescing aerosol removal and very low pressure drop. The inner layer, or initial stage of filtration, effectively traps dirt particles, protecting and extending the life of the outer layer. A metal retainer is used for strength and stability. This media is used in bulk coalescing applications and when relatively high efficiency and low pressure drop are required.

High Efficiency Coalescing Media HEC Grade



Efficiency: 99.97% @ 0.01 micron

Air Flow: Inside to Outside

This coalescing element is composed of an epoxy saturated borosilicate glass micro-fiber tube. The HEC grade filter has a pleated cellulose inner layer as a built-in prefilter. This element is metal retained for added strength, and includes a synthetic fabric layer.

HEC filters are used when “total removal of liquid aerosols and suspended fines” is required. Because of its overall performance characteristics, this grade is most often recommended.

The HEC element is great prefilter protection for desiccant air dryers. This element prevents oil or varnish from coating the desiccant, while maintaining the dryer efficiency.

(1) Compressed Air Challenge, Doc # F9-1, April, 1998-Rev.0.

HFC MEDIA Max. Rated Flows (SCFM) at Various Operating Pressures
(0.25 psi pressure drop)

Model Number	2 psig	20 psig	40 psig	80 psig	100 psig	125psig	150 psig	175 psig	200 psig	220 psig	250 psig
AFF3-0128-HFC	363	753	1187	2056	2490	3033	3575	4118	4661	5095	5746
AFF4-0125-HFC	483	1004	1583	2741	3320	4044	4767	5491	6215	6793	N/A
AFF6-0136-HFC	725	1507	2375	4112	4980	6065	7151	8236	9322	10190	11493
AFF6-0328-HFC	1088	2260	3562	6167	7470	9098	10726	12354	13983	15285	N/A
AFF8-0428-HFC	1450	3013	4750	8223	9960	12131	14302	16472	18644	20380	22984
AFF10-0728-HFC	2538	5273	8312	14391	17430	21229	25028	28826	32627	35665	40222
AFF12-1128-HFC	3988	8286	13062	22614	27390	33360	39330	45298	51271	56045	63206
AFF16-1528-HFC	5438	11299	17812	30837	37350	45491	53632	61770	69915	76425	86190

HEC MEDIA Max. Rated Flows (SCFM) at Various Operating Pressures
(1.5 psi pressure drop)

Model Number	2 psig	20 psig	40 psig	80 psig	100 psig	125 psig	150 psig	175 psig	200 psig	220 psig	250 psig
AFF3-0128-HEC	218	454	715	1238	1500	1827	2154	2481	2808	3069	3462
AFF4-0125-HEC	291	605	954	1651	2000	2436	2872	3308	3744	4092	N/A
AFF6-0136-HEC	437	908	1431	2477	3000	3654	4308	4962	5616	6139	6923
AFF6-0328-HEC	654	1362	2145	3714	4500	5481	6462	7443	8424	9207	N/A
AFF8-0428-HEC	872	1816	2860	4952	6000	7308	8616	9924	11232	12276	13848
AFF10-0728-HEC	1526	3178	5005	8666	10500	12789	15078	17367	19656	21483	24234
AFF12-1128-HEC	2398	4994	7865	13618	16500	20097	23694	27291	30888	33759	38082
AFF16-1528-HEC	3270	6810	10725	18570	22500	27405	32310	37215	42120	46035	51930

Filters for the Food Industry

Sterile Air Filters - 3" to 10" Line Size

Remove all viable organisms

Full compliance with FDA requirements

High flow rates

USDA/FSIS accepted for use in federally inspected meat and poultry plants

Model AKC-0280

Model AKC-1480

Balston® Sterile Air Filters

Balston grade SA filter cartridges, rated at 99.9999+% efficiency for 0.1 micron particles, is at least 30 times better than the accepted standard for sterile air filters developed by independent research organizations in the U.S. and U.K. (request Bulletin TI-105 for a detailed discussion on Balston filter efficiency rating procedure, and Bulletin TI-935 for an independent test report on Balston Sterile Air Filters). Balston Sterile Air Filters are in full compliance with the requirements of the FDA.

Here's what one of your colleagues found:

A Balston sterile air filter assembly, consisting of 1/4" Models of Grade DX, Grade BX, and Grade SA were tested at the University of Massachusetts, Department of Food Science and Nutrition, under the direction of Professor David A. Evans, Ph.D.

"This sterile air system produced commercially sterile air and, to the limits of detection, no viable colonies of microorganisms were found".

- Professor David A. Evans, Ph.D

Filters for the Food Industry

Sterile Air Filters - 3" to 10" Line Size

Principal Specifications

Model	AKC-0280	AKC-0480	AKC-0880	AKC-1480	AKC-2280
Port Size	3" Flange	4" Flange	6" Flange	8" Flange	10" Flange
Maximum Pressure	250 psig (17 barg) (1)	250 psig (17 barg) (1)	200 psig (14 barg) (1)	200 psig (14 barg) (1)	200 psig (14 barg) (1)
Maximum Temperature	230°F (110°C) (2)	230°F (110°C) (2)	250°F (110°C) (2)	250°F (110°C) (2)	250°F (110°C) (2)
Materials of Construction	Carbon steel vessel with 303 Stainless Steel filter tube holders and Buna N seals.				
Closure Type	Flat flanged top with swing bolts and Buna N "O" rings.				
Shipping Weight	132 lbs. (60 kg)	210 lbs. (95 kg)	360 lbs. (163 kg)	590 lbs. (268 kg)	880 lbs. (400 kg)
Dimensions	36"H X 16"W (91cm X 40cm)	36"H X 21"W (91cm X 53cm)	38"H X 25"W (97cm X 64cm)	54"H X 34"W (137cm X 86cm)	56"H X 36"W (142cm X 91cm)
Flange Center Line to Floor Dimension	7.75" (20cm)	6.25" (11cm)	7.5" (19cm)	16.25" (41cm)	17.25" (44cm)

Ordering Information (3)

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

Model	AKC-0280	AKC-0480	AKC-0880	AKC-1480	AKC-2280
Assembly with Grade SA Filter Cartridge & Support Core	AKC-0280-SA	AKC-0480-SA	AKC-0880-SA	AKC-1480-SA	AKC-2280-SA
Filter Cartridges (4)					
Number Required	2	4	8	14	22
Box of 3	3/200-80-❑	3/200-80-❑	3/200-80-❑	3/200-80-❑	3/200-80-❑
Box of 5	5/200-80-❑	5/200-80-❑	5/200-80-❑	5/200-80-❑	5/200-80-❑
Box of 10	200-80-❑	200-80-❑	200-80-❑	200-80-❑	200-80-❑

Notes:

1 Vessel is ASME Section VIII, Division 1 code stamped for rated pressure. All AKC series housings have CRN registration numbers assigned in all Canadian provinces.

2 Maximum operating temperature may be limited by seal material. Consult factory for recommendations at elevated temperatures.

3 Filter assemblies are shipped complete with automatic drain, filter cartridges, and differential pressure indicator.

Automatic Drain

The maximum operating pressure for the Model 20-211 Automatic Drain is 400 psig (28 barg). Minimum operating pressure is 10 psig (0.7 barg).

Differential Pressure Indicator

The maximum operating pressure for the Differential Pressure Indicator Model 41-071 is 250 psig (14 barg). The DPI is sensitive in the range of 0-5 psi (0-0.3 bar).

The Automatic Drain and Differential Pressure Indicator are not included with assemblies containing SA cartridges.

4 To order filter cartridges, indicate the grade of filter cartridge by placing the appropriate letter after the ordering number. Examples: 5/100-12-SA, 100-18-SA, 150-19-SA.

Filters for the Food Industry

Steam Sterilizable Sterile Air Filters - 1/4" to 1" Line Size

Remove all viable organisms

In-line steam sterilization

Low pressure drop

Full compliance with FDA requirements

USDA/FSIS accepted for use in federally inspected meat and poultry plants

Model A33B-SA

Model A45B-SA

Model A27/35B-SA, A27/80B-SA

Balston® Sterile Air Filters

Balston grade SA filter cartridges, rated at 99.9999+% efficiency for 0.1 micron particles, is at least 30 times better than the accepted standard for sterile air filters developed by independent research organizations in the U.S. and U.K. (request Bulletin TI-105 for a detailed discussion on Balston filter efficiency rating procedure, and Bulletin TI-935 for an independent test report on Balston Sterile Air Filters). Balston Sterile Air Filters are in full compliance with the requirements of the FDA.

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Filters for the Food Industry

Steam Sterilizable Sterile Air Filters - 1/4" to 1" Line Size

Principal Specifications

Model	A33B	A45B	A27/35B	A27/80B
Inlet and Outlet Ports	1/4" NPT	1/2" NPT	1" NPT	1" NPT
Drain Port	1/8" NPT (1)	1/8" NPT (1)	1/4" NPT (1)	1/4" NPT (1)
Materials of Construction				
Head	316SS	316SS	316SS	316SS
Bowl	316SS	316SS	316SS	316SS
Internals	316SS	316SS	316SS	316SS
Seals	Viton (2)	Viton (2)	Viton (2)	Viton (2)
Maximum Temperature	400°F (204°C)	400°F (204°C)	400°F (204°C)	400°F (204°C)
Maximum Pressure	425 psig (29 barg) (3)	250 psig (17 barg) (3)	800 psig (55 barg) (3)	800 psig (55 barg) (3)
Maximum Steam Pressure for Sterilization	60 psig (4 barg)	60 psig (4 barg)	60 psig (4 barg)	60 psig (4 barg)
Shipping Weight	3 lbs. (1 kg)	5 lbs. (2 kg)	16 lbs. (7 kg)	20 lbs. (9 kg)
Dimensions	2.6"Dia X 4.9"L (7cm X 12cm)	2.6"Dia. X 8.4"L (7cm X 21cm)	4.0"Dia. X 16"L (10cm X 40cm)	4.0"Dia. X 27"L (10cm X 69cm)

Ordering Information

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

Model	A33B	A45B	A27/35B	A27/80B
Assembly with Grade SA Filter Cartridge	A33B-SA	A45B-SA	A27/35B-SA	A27/80B-SA
Filter Cartridges:				
Number Required	1	1	1	1
Box of 3	3/100-12-SA	3/100-25-SA	3/200-35-SA	3/200-80-SA
Box of 10	100-12-SA	100-25-SA	200-35-SA	200-80-SA

Notes:

1 Condensate drain valve required. Supplied by customer.

2 Constructed of food grade Viton.

3 Maximum pressure ratings are for temperatures to 130°F (54°C). Please consult factory for maximum pressure ratings at elevated temperatures.

Filters for the Food Industry

Steam Sterilizable Sterile Air Filters - 2" to 10" Line Size

Remove all viable organisms

In-line steam sterilization

High flow rates

Full compliance with FDA requirements

USDA/FSIS accepted for use in federally inspected meat and poultry plants

Model AKSB-0280-3-SA

Model AKSB-1480-SA

Balston® Sterile Air Filters

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Filters for the Food Industry

Steam Sterilizable Sterile Air Filters - 2" to 10" Line Size

Principal Specifications

Model	AKSB-0280-2-SA	AKSB-0280-SA	AKSB-0480-SA	AKSB-0880-SA	AKSB-1480-SA	AKSB-2280-SA
Port Size	2" Flange	3" Flange	4" Flange	6" Flange	8" Flange	10" Flange
Materials of Construction	316SS	316SS	316SS	316SS	316SS	316SS
Seals	Viton (1)	Viton (1)	Viton (1)	Viton (1)	Viton (1)	Viton (1)
Maximum Pressure	200 psig (14 barg) (2)	200 psig (14 barg) (2)	200 psig (14 barg) (2)	200 psig (14 barg) (2)	200 psig (14 barg) (2)	200 psig (14 barg) (2)
Maximum Temperature	200°F (93°C)	200°F (93°C)	200°F (93°C)	200°F (93°C)	200°F (93°C)	200°F (93°C)
Maximum Steam Pressure for Sterilization	60 psig (4 barg)	60 psig (4 barg)	60 psig (4 barg)	60 psig (4 barg)	60 psig (4 barg)	60 psig (4 barg)
Shipping Weight	140 lbs. (64 kg)	140 lbs. (64 kg)	210 lbs. (95 kg)	360 lbs. (163 kg)	590 lbs. (268 kg)	880 lbs. (400 kg)
Dimensions	16"W X 36"L (41cm X 91cm)	16"W X 36"L (41cm X 91cm)	20"W X 36"L (53cm X 91cm)	25"W X 38"L (64cm X 97cm)	34"W X 54"L (86cm X 137cm)	36"W X 56"L (91cm X 142cm)

Ordering Information

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

Model	AKSB-0280-2	AKSB-0280-3	AKSB-0480	AKSB-0880	AKSB-1480	AKSB-2280
Assembly with Grade SA Filter Cartridge	AKSB-0280-2-SA	AKSB-0280-SA	AKSB-0480-SA	AKSB-0880-SA	AKSB-1480-SA	AKSB-0280-SA
Filter Cartridges:						
Box of 3	3/200-80-SA	3/200-80-SA	3/200-80-SA	3/200-80-SA	3/200-80-SA	3/200-80-SA
Box of 10	200-80-SA	200-80-SA	200-80-SA	200-80-SA	200-80-SA	200-80-SA
Number per housing	2	2	4	8	14	22

Notes:

1 Constructed of food grade Viton.

2 Vessel is ASME Section VIII Division 1 Code stamped for rated pressure.