



---

# Parker Balston® 6000 Series Harsh Environment Compressed Air Filters

---



# Parker Balston® 6000 Series Harsh Environment Compressed Air Filters

Installation, Operation, and Maintenance Manual



These instructions must be thoroughly read and understood before installing and operating this product. If you have any questions or concerns, please call the Technical Services Department at 800-343-4048, 8AM to 5PM Eastern Time or email at [balston-techsupport@parker.com](mailto:balston-techsupport@parker.com) (North America only). For other locations, please contact your local representative.

## General

When properly installed on a compressed air or gas line, Balston in-line filters effectively remove oil, water, and particulate contamination from a gas supply. The quantity of oil and water and the size of the particulate contamination removed from a gas supply is dependent upon the grade of Balston filter cartridge installed in a Balston filter housing.



**Warning:** To avoid personal injury and/or property damage resulting from over pressurizing the housing, Parker recommends that the customer install a pressure relieving device set at 125% of the maximum pressure rating of the housing.

## Filter Housing Installation

Filter housings are pressure vessels and all system connections and accessory outlets must be leak-tight. It is good practice to apply pipe sealant to the male threads before connecting the pipe to the filter ports. Any lubricant used must be compatible with the filtered media. The use of lubricant facilitates disassembly at a later time, if necessary.

In general, for most applications, the flow direction through the filter cartridge should be from the **inside-to-outside**. Some Balston filters have a flow arrow indicating the flow direction from inside-to-outside through the cartridge.

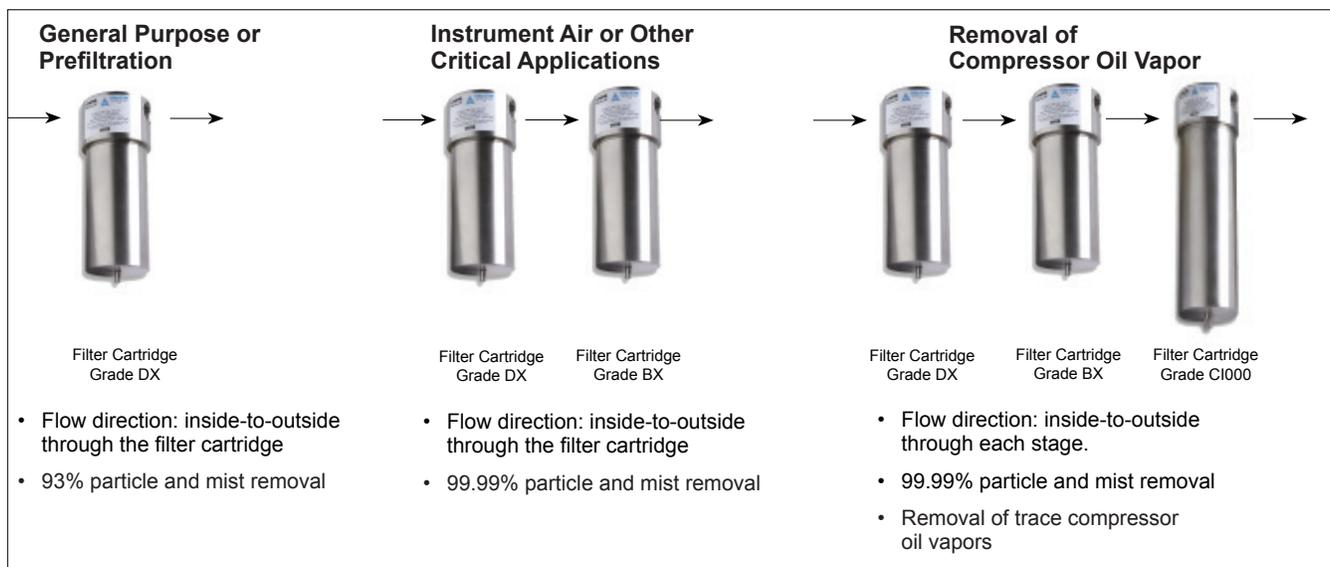
For coalescing applications, the flow of compressed gas through the filter cartridge should be from inside-to-outside. Suspended liquids will be coalesced throughout the cartridge and will drain from the outside of the cartridge into the bowl of the filter assembly. Accumulated liquids may be drained from the filter bowl by automatic or manual drains. For more details on coalescing filtration and liquid drains, request Catalog FNS1.

For installations where the compressed gas is sourced from an overhead line, the gas should be piped from the top of the header to the filter. In this way, excessive moisture and dirt are not gravity-fed to the Balston in-line filter. For installations in which long runs of piping carry filtered gas from the filter to the point of use, filters should be located as close to the point of use as possible to trap condensation and particulate which may have been picked up in the pipe.

Mounting bracket kits are available for most Balston filters. Some Balston filter assemblies may be pipe mounted if the size and weight of the housing and piping permit it. All fittings must be leak tight before applying gas pressure to the filter.

## Operation and Maintenance

The Schematic shows typical schematic installations for three commonly required coalescing applications in compressed air systems.



### Filter Cartridge Installation

**All installation and maintenance activities should be performed by suitable personnel using reasonable care. Turn off the compressed gas supply and depressurize the filter housing prior to performing routine maintenance.**

Most Balston filter housings are ordered separately from Balston filter cartridges. Balston 6000 Series coalescing filter assemblies (e.g., 6004N-0A2-DX), however, are shipped from the factory with the filter cartridge installed. Balston 6000 Series adsorbent filter assemblies (e.g., 6004N-0A2-000) are shipped from the factory with the adsorbent filter packaged separately from the filter housing. The adsorbent cartridge must be installed into the housing prior to installing the housing on the compressed air line. This packaging procedure extends the life of the cartridge by preventing exposure to the atmosphere prior to initial use.

Balston Microfiber® filter cartridges are sealed in place by compression against a flat surface. Gaskets are not required between the filter cartridge and the filter housing. The filter cartridge is centered by guides on the housing which fit the inside diameter of the cartridge at each end. The filter cartridge is sealed by tightening a threaded element retainer on a tie rod. Do not use excessive force, or tools, on the element retainer. The filter cartridge is securely sealed by tightening the element retainer 1-1/2 to 2 turns after it first contacts the filter cartridge.

### Filter Cartridge Life

The efficiency of the Balston Microfiber filter cartridge is relatively unaffected by liquids entrained in the compressed air or gas stream. The life of the filter cartridge is determined by the increase in flow resistance caused by solids trapped within the depth of the filter cartridge. The change in pressure through the filter cartridge should be monitored while the filter is in use. The filter cartridge should be changed when the flow through the housing falls below an acceptable level, or when the pressure drop becomes too high for the application or reaches 10 psid, whichever occurs first. In any case, **the filter cartridge should be changed every 12 months.** (Note: The Balston Microfiber filter cartridge cannot be cleaned by back-flushing because the solids are trapped within the depth of the cartridge, not on the surface.)

Changing filter cartridges more frequently will translate into direct energy savings and reduced operating costs. Annual electricity costs to operate a typical 100 HP compressor can be as high as \$50,000. Pressure drop in the system adds to this expense. A system operating at 100 psig that is experiencing a 2 psig pressure drop through a filter requires an additional 1% in operating energy costs, or approximately \$500.00+ per year.

**Failure of the filter cartridge resulting from a high pressure drop or excessive solids loading may cause damage to the filter housing and/or any downstream equipment.**

In many applications, the pressure drop through the filter assembly may be measured using two pressure gauges, one directly upstream from the filter assembly, and one directly downstream from the filter assembly. In compressed air filtration, however, the pressure drop through the filter assembly is difficult to measure in this way because of inaccuracies in the pressure gauges and rapid fluctuations in system pressure.

**Ordering Replacement Filter Cartridges**

When ordering replacement filter cartridges, specify both the size and grade of the filter cartridge. Filter cartridges for compressed air and gas filter assemblies are available in boxes of 3 (except X-Grade), 5, or 10. The size of the filter is designated by a three-digit number followed by a two digit number (e.g, 100-12, 100-18, 200-176, 200-185). The retention efficiency of the filter is designated by a series of letters or numbers following the size designation (e.g., 100-12-DX, 100-18-BX, 200-185-SA).

To ensure consistent product performance and reliability use only genuine Balston replacement parts and filter cartridges.

**Ordering Filter Assembly Replacement Parts**

When ordering replacement parts, order by part number and description, as detailed on the replacement parts drawing shipped with the filter. Inspect all seals when changing filter cartridges and replace as needed. Lubricate all replacement seals prior to installation. Use a lubricant which is compatible with the gas being filtered.

**Accessories**

**Automatic Float Drains**

If the filter housing is ordered with an automatic float drain, the drain is installed at the factory.

Float drains are available on select assemblies with DX or BX cartridges. They are not available for assemblies with grade CI adsorbent cartridges, grade SA sterile air cartridges.

**External Drains**

If connecting an external drain, such as a solenoid drain, order drain fitting P/N C01-0112 which has 1/8" female NPT threads for easy connection.

**How to Order the Filter Assembly\***

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

\*Consult Factory. Not all configurations are available.

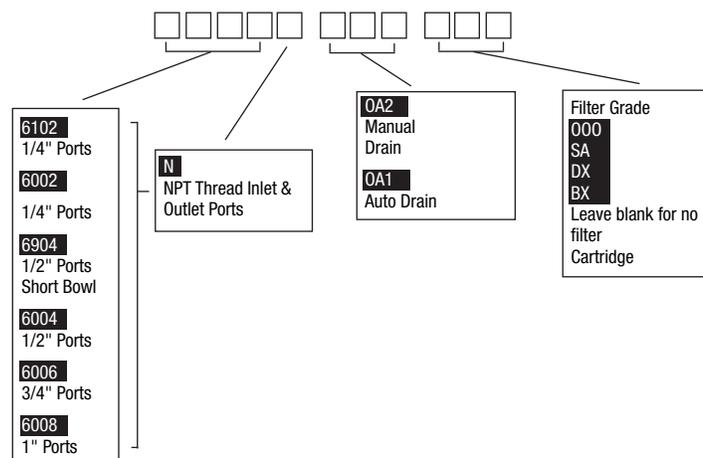


Figure 1 - Parts View

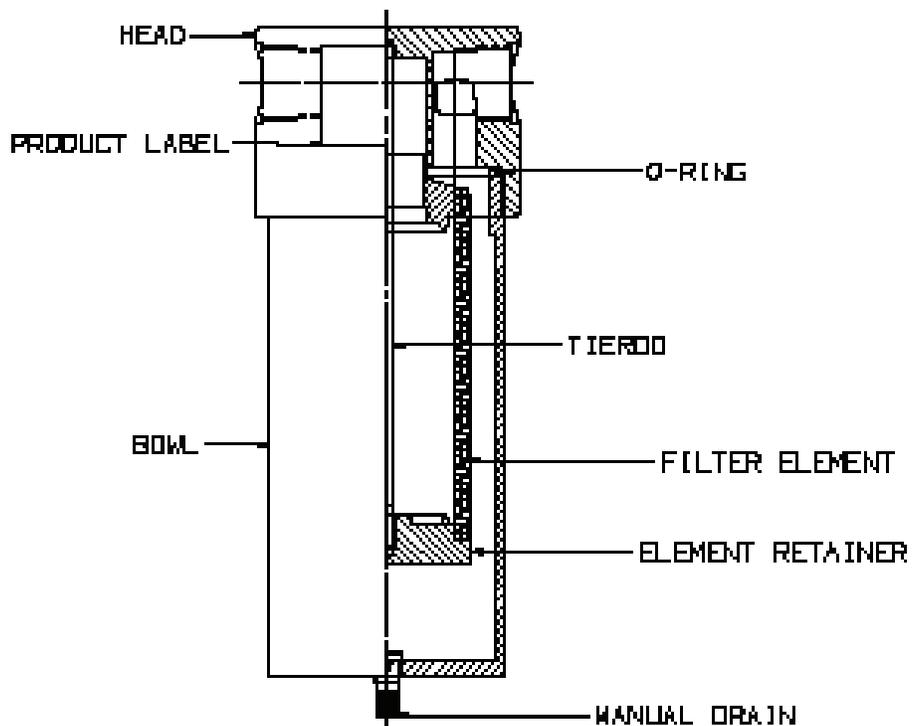
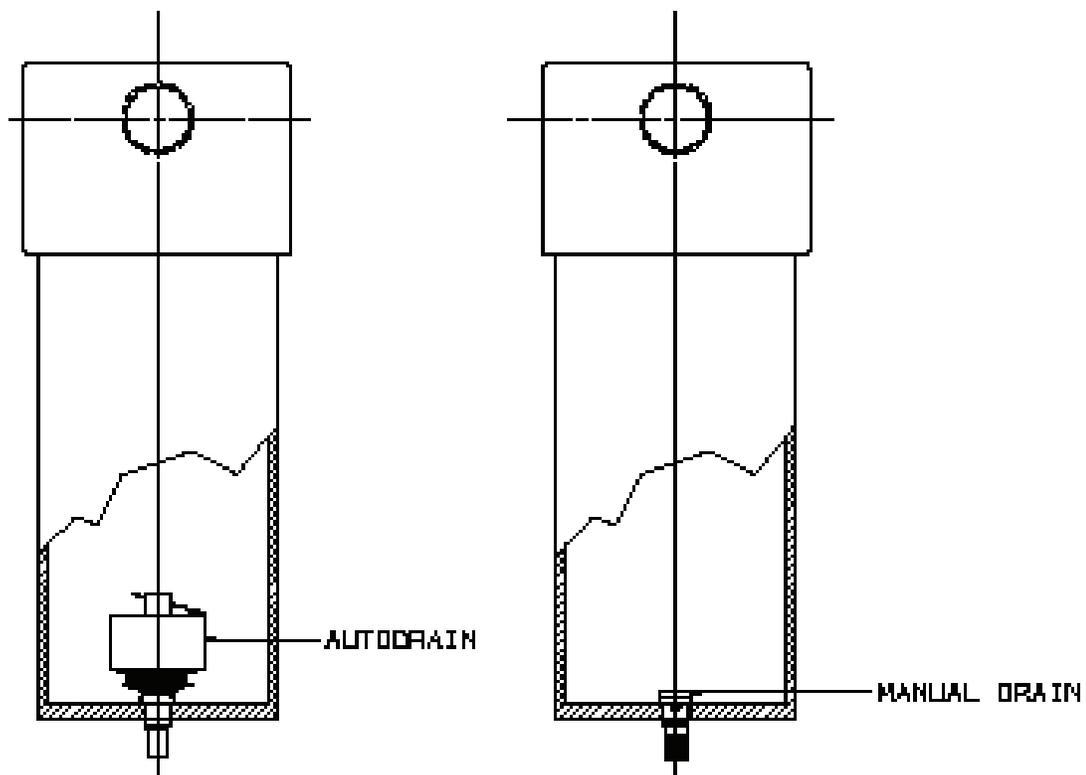


Figure 2 - Drain Details

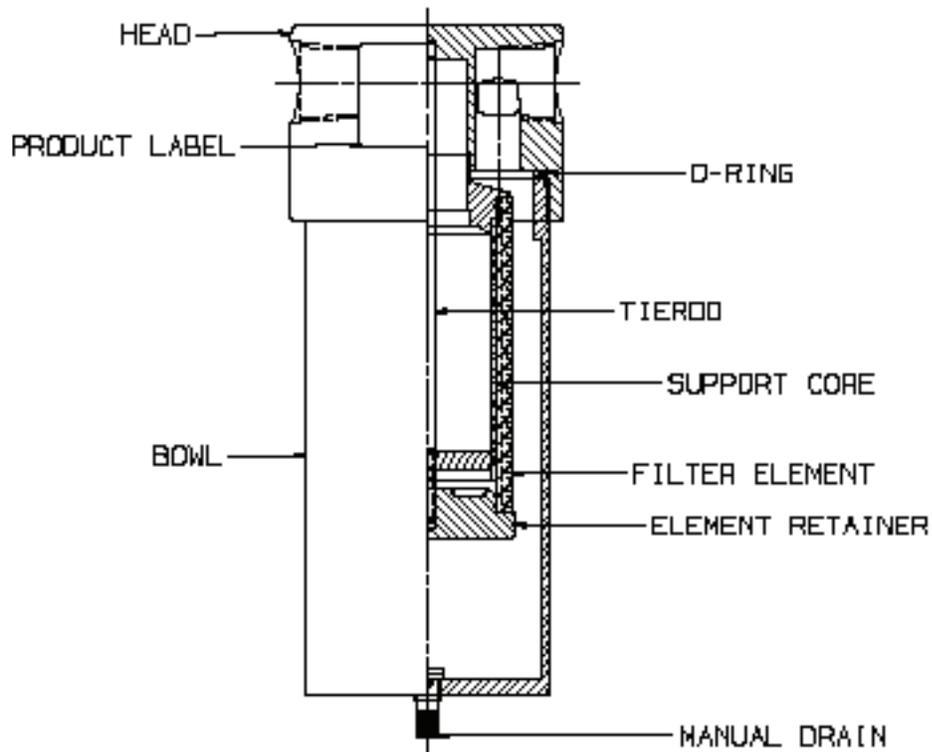


**Ordering Information** For assistance, call toll-free at 1-800-343-4048 8AM to 5PM Eastern Time

Assembly P/N	Head Assembly	Bowl	Tierod	Buna Seal Set	Viton Seal Set	Element Retainer	Filter Tube	Drain Manual	Auto Float Drain	Mounting Bracket Kit	Port Size
6002N-0A2-(?X)	C01-0071	C01-0104	C01-0089	A05-0065	A05-0108	C01-0099	100-12-(?X)	C01-0108	N/A	C01-0094	1/4" NPT
6002N-0A1-(?X)	C01-0071	C01-0104	C01-0089	A05-0065	A05-0108	C01-0099	100-12-(?X)	N/A	C01-0109	C01-0094	1/4" NPT
6002N-0A2-SA	C01-0071	C01-0104	C01-0089	A05-0065	A05-0108	91961	100-12-SA	C01-0108	N/A	C01-0094	1/4" NPT
6002N-0A2-000	C01-0071	C01-0104	C01-0089	A05-0065	A05-0108	C01-0099	CI100-12-000	C01-0108	N/A	C01-0094	1/4" NPT
6904N-0A1-(?X)	C01-0072	C01-0104	C01-0089	A05-0065	A05-0108	C01-0099	100-12-(?X)	NA	C01-0109	C01-0094	1/2" NPT
6904N-0A2-(?X)	C01-0072	C01-0104	C01-0089	A05-0065	A05-0108	C01-0099	100-12-(?X)	C01-0108	NA	C01-0094	1/2" NPT
6004N-0A2-(?X)	C01-0072	C01-0105	C01-0090	A05-0065	A05-0108	C01-0099	100-18-(?X)	C01-0108	N/A	C01-0094	1/2" NPT
6004N-0A1-(?X)	C01-0072	C01-0105	C01-0090	A05-0065	A05-0108	C01-0099	100-18-(?X)	N/A	C01-0109	C01-0094	1/2" NPT
6004N-0A2-SA	C01-0072	C01-0105	C01-0090	A05-0065	A05-0108	91961	100-18-SA	C01-0108	N/A	C01-0094	1/2" NPT
6004N-0A2-000	C01-0072	C01-0105	C01-0090	A05-0065	A05-0108	C01-0099	CI100-18-000	C01-0108	N/A	C01-0094	1/2" NPT
6006N-0A2-(?X)	C01-0075	C01-0106	C01-0091	A05-0066	A05-0109	27900	200-176-(?X)	C01-0108	N/A	C01-0094	3/4" NPT
6006N-0A1-(?X)	C01-0075	C01-0106	C01-0091	A05-0066	A05-0109	27900	200-176-(?X)	N/A	C01-0109	C01-0094	3/4" NPT
6006N-0A2-SA	C01-0075	C01-0106	C01-0091	A05-0066	A05-0109	27900	200-176-SA	C01-0108	N/A	C01-0094	3/4" NPT
6006N-0A2-000	C01-0075	C01-0106	C01-0091	A05-0066	A05-0109	27900	CI200-176-000	C01-0108	N/A	C01-0094	3/4" NPT
6008N-0A2-(?X)	C01-0076	C01-0107	C01-0092	A05-0066	A05-0109	27900	200-185-(?X)	C01-0108	N/A	C01-0094	1" NPT
6008N-0A1-(?X)	C01-0076	C01-0107	C01-0092	A05-0066	A05-0109	27900	200-185-(?X)	N/A	C01-0109	C01-0094	1" NPT
6008N-0A2-SA	C01-0076	C01-0107	C01-0092	A05-0066	A05-0109	27900	200-185-SA	C01-0108	N/A	C01-0094	1" NPT
6008N-0A2-000	C01-0076	C01-0107	C01-0092	A05-0066	A05-0109	27900	CI200-185-000	C01-0108	N/A	C01-0094	1" NPT
6102N-0A0-(?X)	FP7102-02	F06-0031SS	N/A	N/A	A05-0096	F504-0491P	070-063-(?X)	SAP05481	N/A	N/A	1/4" NPT
6102N-0A1-(?X)	FP7102-02	F06-0031SS01	N/A	N/A	A05-0096	F504-0491P	070-063-(?X)	N/A	C02-2392	N/A	1/4" NPT

[ ]= Specify Filter Tube Grade BX or DX

Figure 3 - Parts View, SA version



**Preparing Compressed Air for Sterilization**

All water, oil, and dirt must be removed from compressed air before it enters a sterile air filter. Balston coalescing filters remove these contaminants from compressed air at very high efficiencies, up to 99.99% for 0.01 µm for particles and droplets. Collected liquid drips from the filter cartridge to an automatic drain as rapidly as it enters the filter. A Balston coalescing filter will remove liquids for an unlimited time without loss of efficiency or flow capacity.

Two stages of coalescing filters, a Balston Grade DX followed by a Balston Grade BX, are recommended to satisfy all requirements for preparing compressed air for sterile filtration (see Figure 4 recommended installation diagram on Page 7).

**Installing a Balston Sterile Air Filter Assembly**

**NOTE: All housings with “SA” designations (3rd stage in diagram) must be installed so that flow direction of the compressed air is “outside to inside” through the filter cartridge.**

Special consideration must be taken when the application requires steam sterilization of the sterile air filter. The sterile air filter should be piped so that it may be isolated from the coalescing prefilters when it is being steam sterilized (see Figure 4 schematic installation diagram on Page 7). **Any filter housing which is steam sterilized must be stainless steel.**

The filter housing is a pressure vessel and the system connections and accessory outlets must be leak-tight. Apply a pipe sealant to the male threads before connecting the pipe line to the filter ports. The sealant also permits disassembly at a later time, if necessary. Any sealant such as PTFE tape, paste, or other compound may be used if it is compatible with the filtered media.

**Installing Filter Cartridges**

Microfiber filter cartridges are sealed in place by compression against a flat surface. Gaskets are not required between the filter cartridge and the filter housing. The filter cartridge is centered by guides which fit the inside diameter of the cartridge at each end. In most Balston housing designs, the filter cartridge is sealed by tightening a threaded element retainer on a tie rod. It is not necessary to use excessive force or tools on the element retainer. The filter cartridge is securely sealed by tightening the element retainer 1-1/2 to 2 turns after it first contacts the filter cartridge.

**Changing the Filter Cartridge**

A Microfiber filter cartridge continues to filter at its original efficiency as long as it is kept in service. The life of the filter cartridge is determined by the increase in flow resistance caused by solids trapped within the depth of the cartridge. The filter cartridge should be changed when the flow falls below an acceptable level, or the pressure drop becomes too high. The pressure drop through the cartridge should not exceed 10 psid. The filter cartridge cannot be cleaned by back-flushing, because the solids are trapped in the depth of the cartridge, not on the surface.

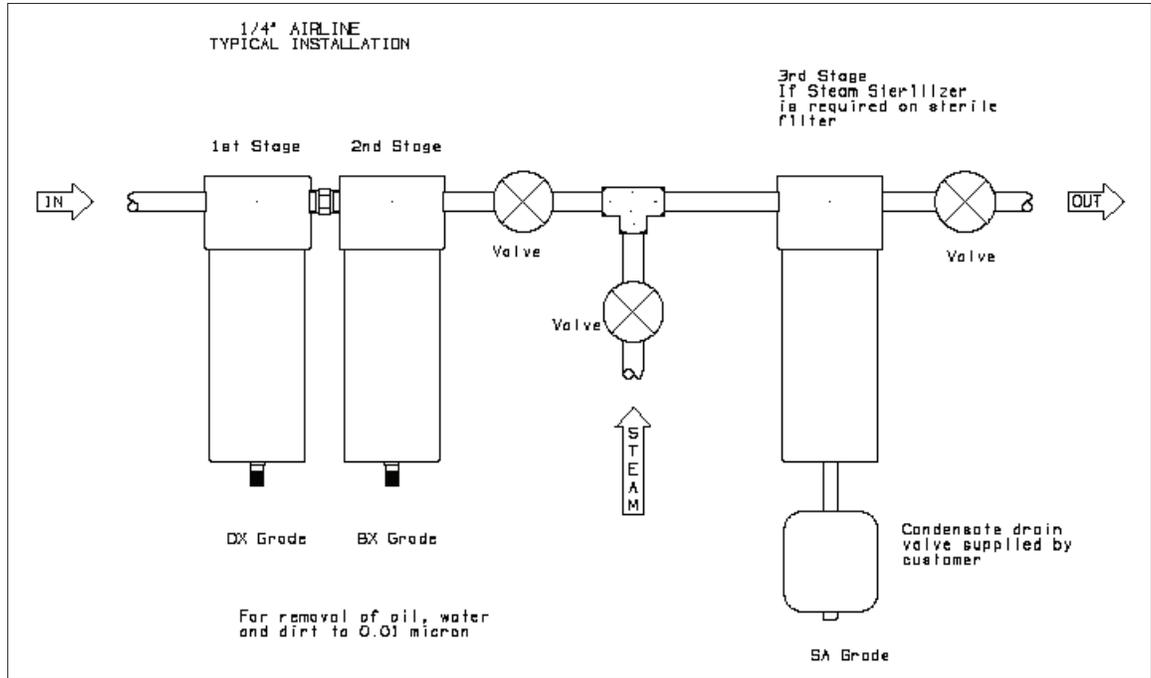


Figure 4 - Schematic Installation

**Summary of Filter Cartridge Recommendations**

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.

Parker Hannifin does not recommend the use of Grade BX without a Grade DX prefilter.

**Steam Sterilization Procedure**

**Steam must flow through the sterile air filter in an outside-to-inside flow direction.**

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

When steam sterilizing, ensure the steam pressure does not exceed 60 psig. It is preferable to hold the steam pressure to 40 psig or less. A typical sterilization cycle consists of using steam at 30 psig for 20 minutes. Steam sterilization time can be increased as desired without harm to the filter cartridges; however, the steam flow rate should not exceed the normal air flow rate for the unit. A condensate drain valve must be installed on the Sterile Air filter to ensure no condensate buildup during the steam sterilization cycle. If condensate is allowed to build up within the housing during steam sterilization, the sterility and integrity of the sterile air filter may be compromised. Typically, the Balston Sterile Air filter cartridge will withstand approximately 60 steam sterilization cycles.

**Use only filtered steam to sterilize a sterile air filter. The use of unfiltered steam may contaminate the filter housing, filter cartridge, and any downstream equipment or piping.**

**Autoclaving Procedure**

The Balston Grade SA sterile air filter cartridges will tolerate temperatures to 300°F (149°C) in dry gas. Viton or other appropriate heat-resistant sealing should be used in the housing during autoclaving. The housing must be rated for the temperature used during autoclaving.

**Ordering and Installing Replacement Parts**

All drawings and a replacement parts list are included with each filter housing/assembly shipped from the factory. When ordering replacement parts, order by part number and description, as detailed on the replacement parts drawing shipped with the filter. When replacing seals, lubricate prior to installation. Use a lubricant which is compatible with the gas being filtered.

**Flow Rates**

Filter Housing Model	Port Size	Filter Cartridge Grade	Flow rates (SCFM), at 7 psi drop at indicated line pressure (over 3 stages). 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
<b>6002N</b>	1/4"	DX	9	19	39	51	63	76	90	117	145
<b>6904N</b>	1/2"	BX	3	8	11	21	25	31	36	47	58
		CI	2	5	7	12	15	18	22	28	35
		SA	---	8	11	21	25	31	36	---	---
<b>6004N</b>	1/2"	DX	19	41	65	113	137	166	196	257	316
		BX	9	19	30	51	63	76	90	117	145
		CI	6	12	19	32	39	48	56	73	90
		SA	---	19	30	51	63	76	90	---	---
<b>6006N</b>	3/4"	DX	37	78	123	214	259	315	371	484	596
		BX	10	21	34	56	70	85	101	131	162
		CI	8	16	26	44	53	65	76	99	122
		SA	---	21	34	56	70	85	101	---	---
<b>6008N</b>	1"	DX	55	115	181	314	380	463	546	711	877
		BX	11	23	37	64	77	94	111	144	178
		CI	10	20	32	56	67	82	96	125	154
		SA	---	23	37	64	77	94	111	---	---
<b>6102N (1)</b>	1/4"	DX	3.5	8	11	20	25	30	36	---	---
		BX	1	2	3.5	5.7	6.8	8	10	---	---

**Notes:**

1 Flow rates (SCFM) for Model 6102N at 2 psi drop at indicated line pressure.

**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 (2)	140°F (60°C)	120°F (49°C)	→	→	→	→
Maximum Pressure (3)	150 psig	175 psig	→	→	→	→
Minimum Pressure (4)	15 psig	15 psig	→	→	→	→
Shipping Weight	1.0 lbs. (1.6kg)	3.5 lbs. (1.6kg)	3.5 lbs. (1.6kg)	4.0 lbs. (1.8kg)	11 lbs. (5kg)	12 lbs. (5.4kg)
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:**

2 Max. temperature with auto drain. Max. temperature with manual drain is 275°F.

3 Max. pressure with auto drain. Max. pressure with manual drain is 250 psi.

4 Required for proper operation of auto drain.

**Explanation of Warning Symbols**

**Symbol**

**Description**



Caution, refer to accompanying documents for explanation.



Refer to the caution/warning note indicated for explanation.



Caution, risk of electric shock.

**Remember To:**

- 1 Complete and mail or fax in your warranty registration card.
- 2 Keep your product certification in a safe place.
- 3 Call the Technical Services Department at 800-343-4048, 8AM to 5P{M Eastern Time (North America only) or email at [balstontechsupport@parker.com](mailto:balstontechsupport@parker.com) with any questions. for other locations, please contact your local representative.

**WARRANTY (NORTH AMERICA ONLY)**

**(FOR INFORMATION CONTACT YOUR LOCAL REPRESENTATIVE)**

Parker Hannifin guarantees to the original purchaser of this product, that if the product fails or is defective within 12 months from the date of purchase, when this product is operated and maintained according to the instructions provided with the product, then Parker guarantees, at Parker's option, to replace the product, repair the product, or refund the original price for the product. This warranty applies only to defects in material or workmanship and does not cover: ring and valve wear on compressors, routine maintenance recommended by the instructions provided with this product, or filter cartridges. Any modification of the product without written approval from Parker will result in voiding this warranty. Complete details of the warranty are available on request. This warranty applies to units purchased and operated in North America.



Parker Hannifin Corporation  
Industrial Gas Filtration and  
Generation Division  
4087 Walden Avenue  
Lancaster, NY 14086  
Tel: 716-686-6400 Fax: 877-857-3800  
[www.parker.com/igfg](http://www.parker.com/igfg)

Parker Hannifin Manufacturing Limited  
Gas Separation and Filtration EMEA Division  
Dukesway, Team Valley Trading Estate  
Gateshead, Tyne and Wear, England NE11 0PZ  
Tel: +44 (0)191 402 9000 Fax: +44 (0)191 482 6296  
[www.parker.com/gsf](http://www.parker.com/gsf) [dhFNS\\_TSG@parker.com](mailto:dhFNS_TSG@parker.com)



CELL: ASSY