

SAYLOR-BEALL MANUFACTURING CO.

COMPRESSED AIR FILTERS
SBS-20-625, SBA-20-625, SBC-20-625, SBV-20-625

INSTRUCTION MANUAL

Contents

TYPE IDENTIFICATION	2
1.0 INSTALLATION	3
2.0 OPERATION	5
3.0 MAINTENANCE	6
DIMENSIONS AND WEIGHTS	7
WARRANTY	8

General Safety Information

1. Pressurized devices

WARNING

- Do not exceed maximum operating pressure indicated on serial number tag.
- Make certain filter is fully depressurized before servicing.

2. Breathing Air

- Air treated by this equipment may not be suitable for breathing without further purification. Refer to OSHA standard 1910.134 for breathing air requirements.

3. Flammable gases

WARNING

While the materials of construction are compatible with many flammable gases, the following application limitations must be considered:

- Housing materials are slightly porous. The product must be used in a well ventilated area in the absence of sparks or ignition sources. Do not use in Class 1, Division 1, Group D environments.
- The type of area - forced exhaust system used (i.e., high or low level) would be dependent on the gas involved.
- Each application (other than for air or inert gas) must be reviewed to minimize fire or explosion hazard.

SERVICE DEPARTMENT: (724) 746-1100

Type Identification

Filter type can also be identified by the color of the foam outer sleeve.

Type	Description	Type	Outer foam color
SBS	Separator/filter	Mechanical separator and 3 micron coalescer	none
SBA	General purpose air line filter	1 micron coalescer	none
SBC	High efficiency oil removal filter	High efficiency (99.99+%) coalescer	Red
SBV	Oil vapor removal filter	Activated carbon adsorber	Green

1.0 Installation

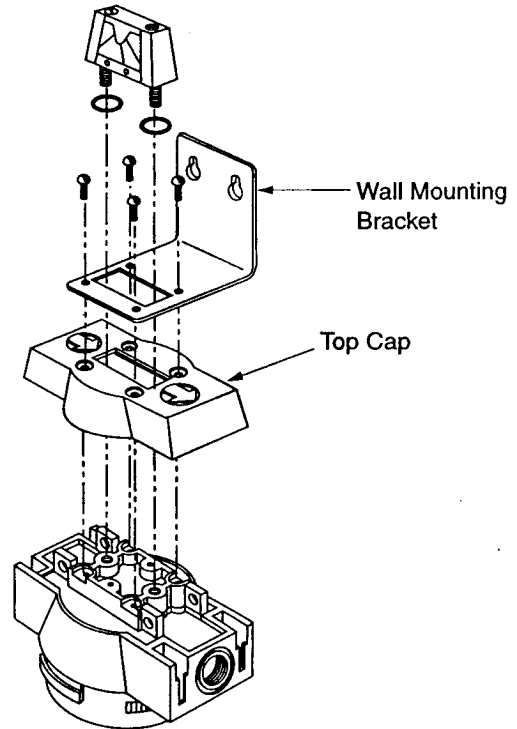
A. Where Used/Air Quality After Filtration

Type	Where used	Solid particle removal (maximum size in microns)	Liquid removal efficiency (at rated conditions)	Maximum inlet liquid loading ppm w/w	Remaining oil content ppm w/w
SBS	Separator - downstream of an aftercooler Point-of-use - where no aftercooler is installed upstream	3	99+% of water	25,000	5 aerosols
SBA	Prefilter - • Alone ahead of desiccant dryers if no oil is present • Ahead of Grade 3 Afterfilter - downstream of pressure-swing (heatless) desiccant dryers Point-of-use - where aftercooler is installed upstream	1	100% of water	2,000	1 aerosols
SBC	Prefilter - alone ahead of desiccant and membrane dryers if oil is present Afterfilter • Downstream of refrigerated dryer • Downstream of pressure-swing (heatless) desiccant dryers for finer solid particle removal	0.01	99.99+% of oil	1,000	0.01 aerosols
SBV	Use a Grade 7 or Grade 5 ahead of Grade 1 to remove any liquid present	0.01	Removes vapors only	No liquid should be present	0.003 vapor

B. Mounting

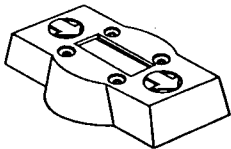
1. Wall mounting brackets - Mount bracket to filter head:

- (1) remove four (4) screws holding black plastic top cap to filter head
- (2) place bracket on head over plastic cap
- (3) install screws supplied with bracket.



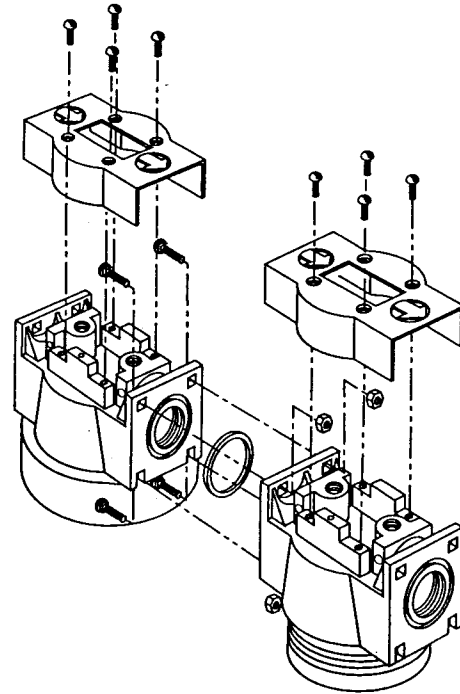
C. Piping

1. Before installing, blow out pipe line to remove scale and other foreign matter.
- .. This unit has DRYSEAL pipe threads; use pipe compound or tape sparingly to male threads only.
3. Mounting (Types SBS, SBA, SBC) - mount so that inlet and outlet connections are horizontal (filter bowl vertical) to ensure proper liquid drainage.
4. Flow Direction - install so that the air flow is in the direction of arrows on the filter head. Flow through the element is inside out.



b. Threaded heads

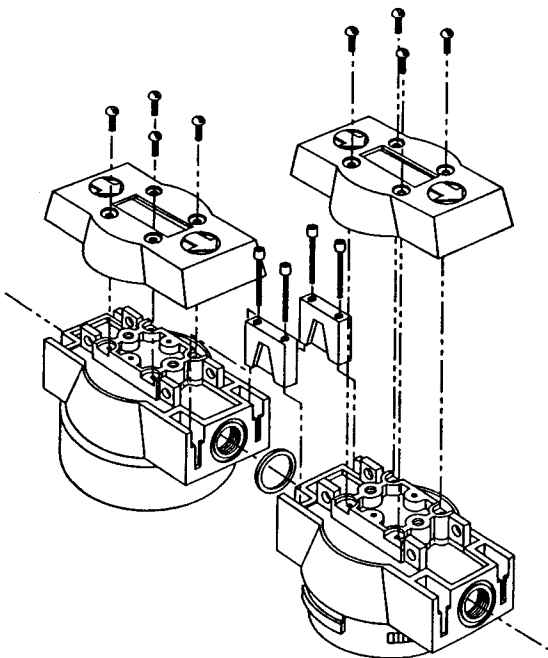
Use four carriage bolts, nuts and o-ring (sold as kit). Remove black plastic top caps, apply generous amount of lubricant to o-ring, install o-ring in groove, and install bolts and nuts.



5. Direct filter-to-filter (modular) connection - Filter heads may be joined without using a pipe nipple

- a. Bayonet type heads - Use two (2) modular connectors, o-ring, and four (4) socket head cap screws (sold as kit)

Remove black plastic top cap, apply generous amount of lubricant to o-ring, install o-ring in groove, and insert connectors. Screw connectors to head using socket head cap screws.



NOTE: Make certain flow direction through filters is correct (pin holes used for aligning top caps should be in the same position on all filters; when hole is in the front, inlet is to the left).

NOTE: Lubricate o-ring with generous amount of lubricant before installation.

6. Isolation valves and by-pass piping - For ease of service, isolation and by-pass valves are desirable. In critical applications, two filters installed in parallel may be necessary to avoid interruption of air supply.

D. Drain provisions

1. Internal Automatic Drains - Drain line
The bottom of internal automatic drains are provided with 1/8" (inside threads) for connection of a drain line if desired.
2. External Auto Drains - External auto drains may be added as follows:

Sizes 20 through 170 - remove internal drain and install adapter (available from factory). Adapter outlet connection is 1/8" (inside threads).

Sizes 250 and 375 - remove adaptor fitting from bottom of bowl; 1/2" (inside threads) port is available for external drain connection

Sizes 485 and 625 - remove pipe plug; 1/2" (inside thread) port is available for external drain connection

2.0 Operation

WARNING: Do not operate filter at pressures in excess of Maximum Working Pressure indicated on Serial Number Tag.

NOTE: Maximum Operating Temperature - 150°F, 66°C. Liquid filtration above 120°F, 49°C is not recommended since there is typically oil present in a vapor state which passes through the filter and condenses downstream.

NOTE: Type SBV - If operated above 100°F, 38°C may experience less than 1000 hours of life because of greater oil vapor content.

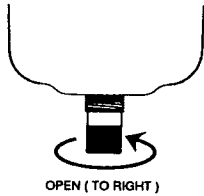
A. Liquid Draining - Types SBS, SBA, SBC

NOTE: Collected liquids must be removed to ensure proper operation.

NOTE: Depressurize slowly, to avoid filter element damage.

1. Manual Drain - Turn to your right (clockwise) to open and to your left (counterclockwise) to close.
2. Automatic Drain - Liquids will automatically discharge when sufficient accumulation occurs.
 - a. Internal Auto Drains - These drains may be manually drained by turning to your right (clockwise) to open and to your left (counterclockwise) to close.

NOTE: Manually drain internal auto drains daily to verify drain function.



B. Operational Checkpoints

Types SBS, SBA, SBC

1. Check pressure drop across the filter
 - a. Pressure differential in excess of 10 psi (0.7 kgf/cm²) - pressure indicator in red area - indicates that the filter sleeve or element should be replaced.

NOTE: Element should be changed annually or when indicator changes to red, whichever occurs first.

NOTE: Pressure drop should never exceed 50 psi (3.5 kgf/cm²).

- b. Check for sudden reduction in pressure drop. This might indicate:
 - (1) Possible leak across element o-ring seal
 - (2) Leak through the element due to physical damage
2. Check flow, pressure, and temperature to make certain filter is being operated within design conditions.

3. Check to see that filter is installed level to insure proper drainage.
4. Check that manual drains are drained periodically or that automatic drains are functioning.

NOTE: On models with Liquid Level Sight glass - Check that orange ball is below top of Sight glass.

Type SBV

1. Check for an oily smell by opening the manual valve. If an oily smell exists, the following should be checked:
 - a. Filter element adsorption capacity exhausted
 - b. Leak across element o-ring seal
 - c. Leak through element due to physical damage
 - d. Presence of liquids because of lack of or failure of prefilters
 - e. Flow, pressure and temperatures outside design conditions
 - f. Presence of gaseous impurities which cannot be adsorbed

CAUTION: Methane, carbon monoxide, carbon dioxide and various inorganic gases cannot be removed by a Type SBV filter.

C. Flow Capacity

Maximum air flow for the various filters at 100 psig (7 kgf/cm²) is indicated in Table 1. To determine maximum air flows at inlet pressures other than 100 psig (7 kgf/cm²), multiply flow from Table 1 by air flow correction factor from Table 2 that corresponds to the minimum operating pressure at the inlet of the filter.

NOTE: Filters should not be selected by pipe size. Select using flow rate and operating pressure only.

Table 1 - Maximum Flow @100 psig (7 kgf/cm²)

Size	scfm [m ³ /min]
20	20 [0.57]
35	35 [1.00]
60	60 [1.72]
100	100 [2.9]
170	170 [4.9]
250	250 [7.2]
375	375 [11]
485	485 [14]
625	625 [18]

Table 2 - Air Flow Correction Factor

Minimum Inlet Pressure	psig	20	30	40	60	80	100	120	150	200	250	300
	kgf/cm ²	1.4	2.1	2.8	4.2	5.6	7.0	8.4	10.6	14.1	17.6	21.1
Correction Factor		0.30	0.39	0.48	0.65	0.82	1.00	1.17	1.43	1.87	2.31	2.74

3.0 Maintenance

A. When to Replace Filter Element

NOTE: Types SBA, SBC, SBV - complete element is replaced; Type SBS - unless separator core is damaged outer sleeve only is replaced.

1. Types SBS, SBA, SBC
 - a. Initial (dry) pressure drop: 1 psi (0.07 kgf/cm²) to 2 psi (0.14 kgf/cm²)
 - b. Operating pressure drop: As filter becomes liquid loaded (wetted), pressure drop will increase to 2 to 6 psi (0.14 to 0.42 kgf/cm²). Further pressure drop occurs as element loads with solid particles.

FOR MAXIMUM FILTRATION EFFICIENCY, REPLACE ELEMENT WHEN PRESSURE DROP REACHES 10 PSI (0.7 KGF/CM²) (INDICATOR IN RED AREA) OR ANNUALLY, WHICHEVER OCCURS FIRST.

NOTE: Pressure drop may temporarily increase when flow is resumed after flow stoppage. Pressure drop should return to normal within one hour.

NOTE: Type SBC - During normal operation bottom of foam sleeve will have a band of oil. Spotting above the band indicates that liquids are accumulating faster than they can be drained and that prefiltration is required.

2. Type SBV
 - a. Adsorption capacity - 1000 hours at rated capacity. Element life is exhausted when odor can be detected downstream of the filter.

B. Procedure for Element Replacement

WARNING: THIS FILTER IS A PRESSURE CONTAINING DEVICE. DEPRESSURIZE BEFORE SERVICING. If filter has not been depressurized before disassembly, an audible alarm will sound when the bowl begins to be removed from the head. If this occurs, stop disassembly, isolate and completely depressurize filter before proceeding.

1. Isolate filter (close inlet and outlet valves if installed) or shut off air supply.
2. Depressurize filter by slowly opening manual drain valve.
3. Remove bowl
 - a. For sizes 20 through 170 - bayonet mount - push bowl up, turn bowl 1/8th turn to your left, and pull bowl straight down
 - b. For sizes 25 through 625 - threaded bowls - unscrew bowl from head using hand, strap wrench or C spanner.
4. Clean filter bowl
5. Replace element

a. Replacing complete element

- 1) Pull off old element and discard
- 2) Make certain o-ring inside top of replacement element is in place and push element onto filter head.

NOTE: Types SBC and SBV- Do not handle elements by outside foam cover. Handle by bottom end cap only.

b. Type SBS - replacing sleeve only

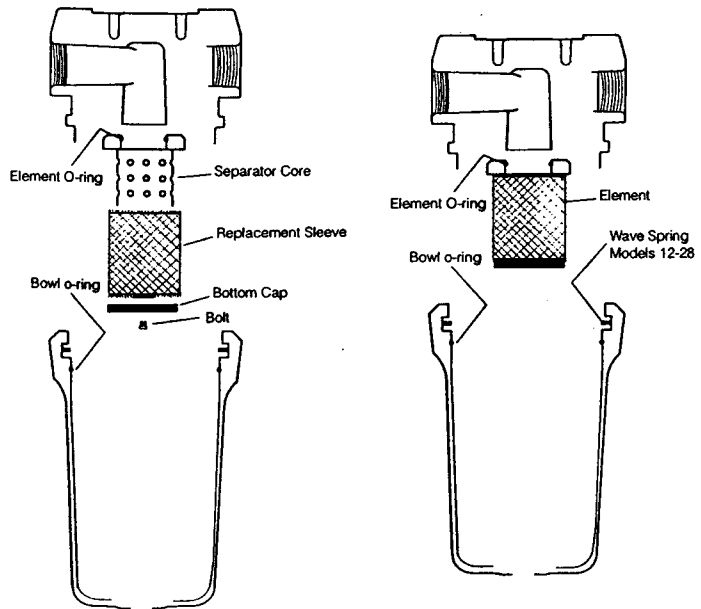
- 1) Pull element straight down to remove.
- 2) Remove bolt and bottom cap and remove disposable filter sleeve.
- 3) Clean separator core with soap and water if necessary.
- 4) Slide new filter sleeve over separator core and replace bottom cap and hand tighten bolt.
- 5) Make certain o-ring inside top of element is in place and push element onto filter head.

6. After making certain that o-ring inside top of bowl (and on bayonet mount heads, wave spring) are in place, reassemble bowl to head.

NOTE: Make certain o-ring is generously lubricated.

NOTE: Wave spring ends should be pointed down to prevent the wave spring from interfering with reassembly.

NOTE: Threaded bowl to head connection, generously lubricate threads with a high grade/temperate lubricate 150°F, 66°C.



Type SBS - Sleeve Replacement

All Types - Element Replacement

C. Auto Drain Mechanism

It is recommended that drain mechanism be replaced annually.

Dimensions and Weights

Filter Size	20	35	60	100	170	250	375	485	625
Replacement Element (2)	20	35	60	100	170	250	375	485	625
Nominal Air Flow scfm @100 psig (m ³ /min @ 7.0 bar)	20 (.57)	35 (1.00)	60 (1.72)	100 (2.9)	170 (4.9)	250 (7.2)	375 (11)	485 (14)	625 (18)
In/Out Connection	NPT or BSP	1/2	1/2	1	1	1-1/2	1-1/2	2	2-1/2
"A"	4.13 (105)	4.13 (105)	4.13 (105)	5.25 (133)	5.25 (133)	6.44 (164)	6.44 (164)	7.63 (194)	7.63 (194)
"B"	10.05 (255)	10.05 (255)	12.40 (316)	13.32 (338)	17.57 (446)	20.80 (528)	25.29 (642)	29.08 (739)	34.83 (885)
"C"	8.59 (224)	8.59 (224)	10.97 (285)	11.74 (298)	15.99 (406)	18.98 (482)	23.47 (596)	26.83 (681)	32.58 (827)
"D"	3.00 (76)	3.00 (76)	3.00 (76)	3.50 (89)	3.50 (89)	4.00 (102)	4.00 (102)	4.00 (102)	4.00 (102)
Weight	7.9 (3.58)	8.1 (3.67)	8.5 (3.86)	9.6 (4.35)	10.5 (4.76)	10.2 (4.63)	11.3 (5.13)	28 (12.70)	33 (14.97)
Maximum Working Pressure	300 psig, 21 bar (1)								
Maximum Operating Temperature	150°F, 66°C								
Head Material	Zinc			Aluminum			Aluminum		
Bowl Material	Zinc			Aluminum			Steel		
Liquid Level Indicator Material	Isoplast			Isoplast			-----		

NOTES

(1) Filter assemblies with a Liquid Level Indicator or an Automatic Float Drain installed will have a maximum working pressure of 250 psi (17 bar)

(2) Designate element (e.g. EE-20)

Filter Type	Element
SBS	EE-(Size)
SBA	EA-(Size)
SBC	EC-(Size)
SBV	EV-(Size)

