

# ARO®

## SHOCK BLOCKER™

FLUID PULSATION DAMPENERS



# The Automatic Shock Blockers

For over 90 years, the ARO® Fluid Products business of Ingersoll Rand® has developed partnerships with more than 200 original equipment manufacturers and distributors, enabling us to better focus on the unique pumping needs of many industries. It's a strategic merger of our partners' application expertise, along with our decades-long legacy of designing and building outstanding piston and diaphragm pumps.



*Foaming*



*Material Pulsation*



*Hydraulic Shock*



*Splashing*

Diaphragm and piston pumps of any type have at least two points in their cycle where they provide no pressure or flow to a process. The unwanted result of this pressure fluctuation can often be material foaming, material pulsation, hydraulic shock or material splashing. While traditional pulsation dampeners can help reduce unwanted pulsation and other problems, they also require operator intervention and adjustments.

## Applications where Shock Blockers provide advantages:

- Fluid Dispensing Control
- Inline Flow Meter Protection
- Long Pipe Runs
- Equipment Protection (Pumps, Meters, Piping)
- High Back Pressure Application



# Design Features

1", 2" AND 3" SHOCK BLOCKERS

- Automatic Air Adjustment - compensates for fluctuations in fluid pressure without operator intervention.
- Significant Pulsation Reduction - the new Shock Blockers deliver an average 60% - 80% pulsation reduction in high back pressure applications.
- Perfect for Process Applications - pulsation reduction in long piping runs help prevent costly fluid pipe and downstream valve damage.
- Built for High-Flow/Aggressive Fluid Applications - the 2" models can handle up to 159 in.<sup>3</sup> maximum fluid volume, and 3" models up to 509 in.<sup>2</sup> maximum fluid volume.
- Broad Material Range for Compatibility - choose from PVDF, polypropylene, groundable acetal, aluminum, cast iron or stainless steel body materials for optimum pump-to-pulsation dampener compatibility
- Broad Diaphragm/Bladder Fluid Compatibility - choose from Santoprene®, Nitrile, PTFE, Viton or Urethane for optimum fluid-to-diaphragm compatibility.
- Bolted Construction - for leak-free vessel integrity and a safer work-site.
- Ultra-Rugged Construction for Long service Life - both inside and out, the new Shock Blockers re built tough to deliver worry free, near pulse-free fluid handling.

## Performance Charts

| Fluid Pressure<br>PSI Back Pressure | 1/2" Pump w/1" Shock Blocker |    |    |            |    | % Reduction In Pulsation |    |
|-------------------------------------|------------------------------|----|----|------------|----|--------------------------|----|
|                                     | 20                           | 40 | 60 | 1          | 2  | 3                        | 4  |
|                                     | 94                           | 92 | 91 | 81         | 83 | 85                       | 70 |
|                                     |                              |    |    | 10         | 12 |                          | 65 |
|                                     |                              |    |    | Flow (GPM) |    |                          |    |

| Fluid Pressure<br>PSI Back Pressure | 1" Pump w/1" Shock Blocker |    |    |    |            | % Reduction In Pulsation |    |
|-------------------------------------|----------------------------|----|----|----|------------|--------------------------|----|
|                                     | 20                         | 40 | 60 | 80 | 1          | 5                        | 10 |
|                                     | 90                         | 99 | 85 | 85 | 80         | 75                       | 70 |
|                                     |                            |    |    |    | 15         | 20                       | 25 |
|                                     |                            |    |    |    | Flow (GPM) |                          |    |

| 1-1/2" Pump w/2" Shock Blocker |    | % Reduction In Pulsation |
|--------------------------------|----|--------------------------|
| 40                             | 80 | 70                       |
| 60                             | 89 | 70                       |
| 80                             | 80 | 65                       |
| 100                            | 80 | 70                       |
|                                |    | 1 20 40 60 80            |
| Flow (GPM)                     |    |                          |

| Fluid Pressure<br>PSI Back Pressure | 2" Pump w/2" Shock Blocker |    |    |     |            | % Reduction In Pulsation |    |
|-------------------------------------|----------------------------|----|----|-----|------------|--------------------------|----|
|                                     | 40                         | 60 | 80 | 100 | 3          | 30                       | 70 |
|                                     | 65                         | 70 | 70 | 60  | 55         | 60                       | 55 |
|                                     |                            |    |    |     | 100        | 130                      |    |
|                                     |                            |    |    |     | Flow (GPM) |                          |    |

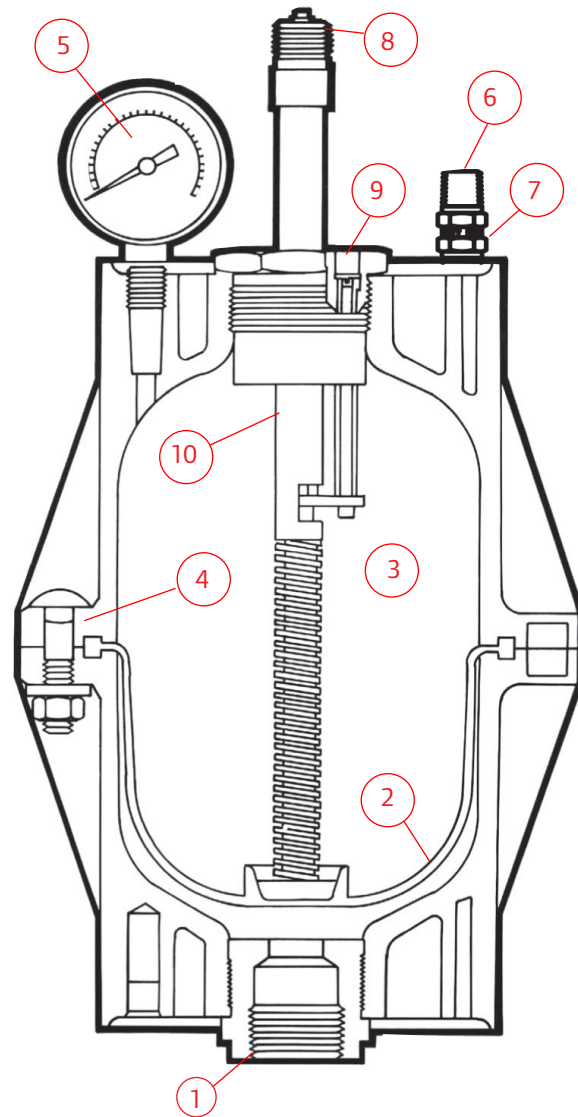
| Fluid Pressure<br>PSI Back Pressure | 3" Pump w/3" Shock Blocker |    |    |     |            | % Reduction In Pulsation |     |
|-------------------------------------|----------------------------|----|----|-----|------------|--------------------------|-----|
|                                     | 40                         | 60 | 80 | 100 | 5          | 75                       | 125 |
|                                     | 60                         | 65 | 60 | 60  | 50         | 55                       | 50  |
|                                     |                            |    |    |     | 150        | 200                      |     |
|                                     |                            |    |    |     | Flow (GPM) |                          |     |



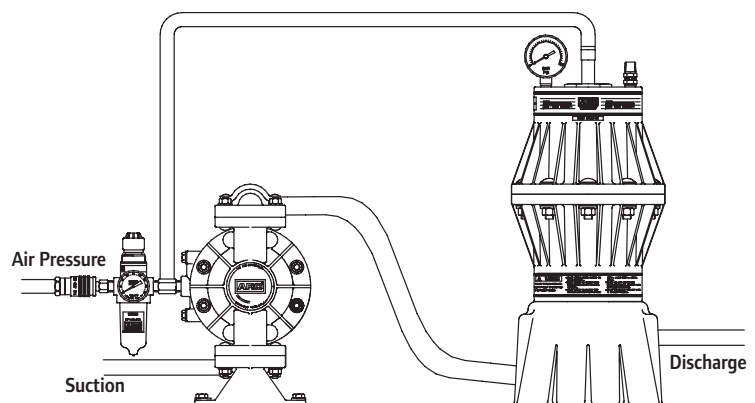
# Design Features

## 1" NON-METALLIC SHOCK BLOCKER

- ① **Fracture-Resistant Fluid Inlet** minimizes the chance of cracking the main vessel's housing while threading.
- ② **Bladder** flexes as fluid pulses from the pump.
- ③ **Enlarged Air Chamber** provides superior smoothing of fluid pressure.
- ④ **Flange Bolt Fasteners** make assembly faster and easier and insures a leak-free seal.
- ⑤ **Pressure Gauge** (included) provides easy visibility for convenient process monitoring.
- ⑥ **Pressure Relief Valve** minimizes the possibility of vessel over-pressurization (above 125 PSI).
- ⑦ **Grounding Lug** provides convenient ground connection.
- ⑧ **Air-Tamer Auto-Adjust Assembly**  
Unlike other air adjusters, Air-Tamer has no lip seals along its piston to wear out, and all moving parts are encased inside the dampener housing.
- ⑨ **Bleed Port** can be plumbed to drain off material in the event of bladder failure.
- ⑩ **Bladder Guard** prevents damage or rupture of the bladder.



### Typical Installation Used with 1/2" & 1" Ported Diaphragm Pumps



# 1" Non-Metallic Shock Blocker

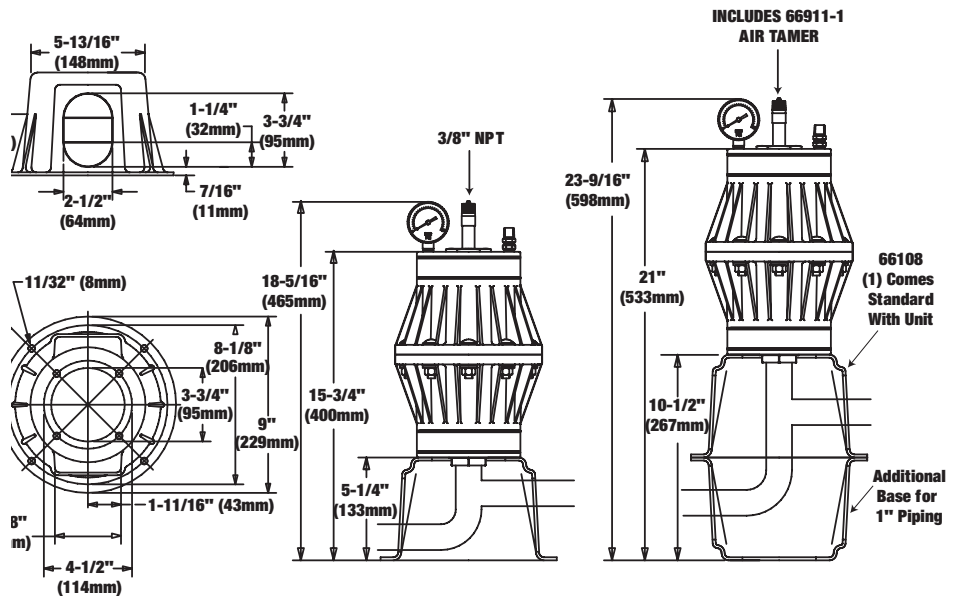


1" Shock Blocker

## Specifications

|                                 |                                                                                                                                                     |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Pulsation Dampener Type         | Non-Metallic / Automatic                                                                                                                            |
| Material                        | See model description chart                                                                                                                         |
| Weight                          | Polypropylene 8.4 lbs (3.8 kgs)<br>Conductive Acetal 8.6 lbs (3.9 kgs)<br>Pure Kynar (PVDF) 9.0 lbs (4.1 kgs)                                       |
| Material Inlet/Outlets          | SB10X-AXX 1" - NPTF (Female) (Both are available)<br>SB10X-BXX - 1" BSP (Female)                                                                    |
| Air Inlet                       | Air Tamer is 3/8" NPTF (Male) (Standard)                                                                                                            |
| Maximum Air Inlet Pressure      | 100 PSIG (6.9 bar)                                                                                                                                  |
| Maximum Material Inlet Pressure | 100 PSIG (6.9 bar)                                                                                                                                  |
| Maximum Temperature Limits      | Polypropylene 35° F - 100° F (+1.6° C - 37.7° C)<br>Conductive Acetal 10° F - 180° F (-12° C - 82° C)<br>Pure Kynar 10° F - 200° F (-12° C - 93° C) |
| Maximum Fluid Volume            | 57 In. <sup>3</sup> (931)                                                                                                                           |

## Dimensions



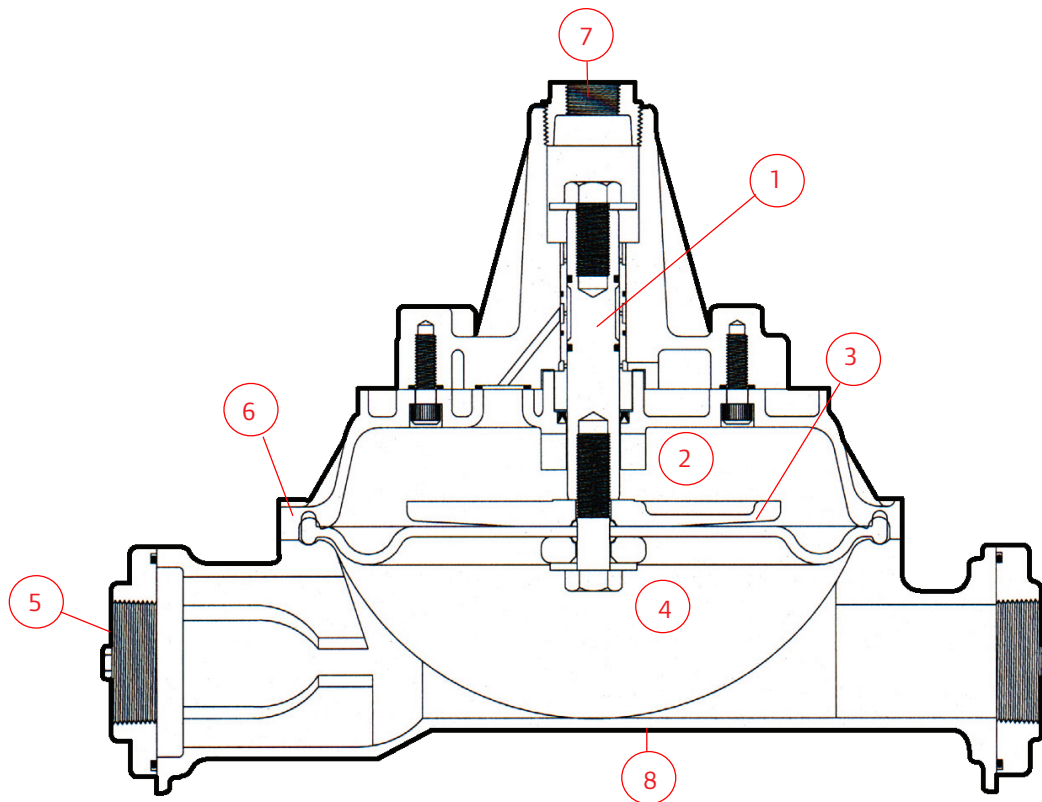
## Ordering

| Position | 1  | 2  | 3 |   | 4 | 5 | 6 |   | 7 |
|----------|----|----|---|---|---|---|---|---|---|
| Example: | SB | 10 | X | - | X | X | X | - | X |

| Position 1<br>Model<br>Series | Position 2<br>Size | Position 3<br>Air Body                                              | Position 4<br>Thread | Position 5<br>Fluid<br>Construction                                 | Position 6<br>Hardware | Position 7<br>Diaphragm                                  |
|-------------------------------|--------------------|---------------------------------------------------------------------|----------------------|---------------------------------------------------------------------|------------------------|----------------------------------------------------------|
| SB- Shock Blocker             | 10 - 1"            | P - Polypropylene<br>K - Pure Kynar (PVDF)<br>D - Conductive Acetal | A - NPT<br>B - BSP   | P - Polypropylene<br>K - Pure Kynar (PVDF)<br>D - Conductive Acetal | S - Stainless (304)    | A - Santoprene<br>C - Hytrel<br>T - PTFE<br>U - Urethane |

# Design Features

2" & 3" METALLIC SHOCK BLOCKER

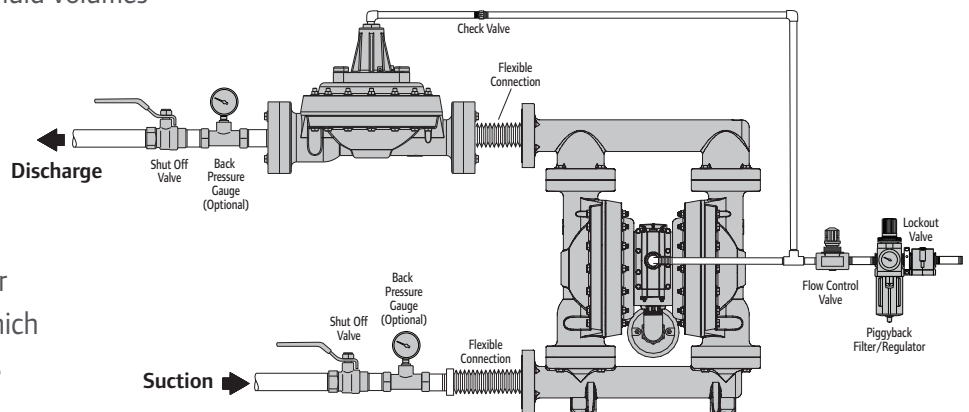


- ① **Auto-Adjust Valve** Similar to ARO's patented Air Tamer design; automatically adjusts to fluid pressure to reduce pulsation
- ② **Air Chamber** Large air chamber offers air support to the diaphragm during the pulsation process and smoothing of fluid pressure
- ③ **Diaphragm** flexes as fluid pulses from the pump
- ④ **Large Fluid Section** offers sensitivity for 2" and 3" diaphragm pump fluid volumes
- ⑤ **Fluid Inlet/Outlet Ports**  
NPTF & BSPP internal pipe threads for 2" & 3",  
ANSI/DIN Option for 2"
- ⑥ **Bolted Fasteners**  
For leak-free integrity, similar design and characteristics which set ARO® Diaphragm Pumps apart from the competition

- ⑦ **Air Inlet** Will accept same air line pressure as diaphragm pump
- ⑧ **Part Interchangeability** Utilize parts from the 2" & 3" diaphragm pump

► **Typical Installation** SB20X use with 1-1/2" and 2" Diaphragm Pumps, SB30X use with 3" Metal Diaphragm Pumps

*Proper support of piping and pulsation dampener is required.*



# 2" & 3" Metallic Shock Blocker



## Specifications

Pulsation Dampener Type

Metallic / Automatic

Material

See model description chart

Weight

SB20X Aluminum (fluid cap) 29 lbs (13.2 kgs)  
 SB20X Cast Iron (fluid cap) 70 lbs (31.8 kgs)  
 SB20X Stainless St. (fluid cap) 71 lbs (32.2 kgs)  
 SB30X Aluminum (fluid cap) 41 lbs (18.6 kgs)  
 SB30X Cast Iron (fluid cap) 94 lbs (42.6 kgs)  
 SB30X Stainless St. (fluid cap) 96 lbs (43.5 kgs)

Material Inlet/Outlets

SB20X-AXX-X 2" -11-1/2 NPTF -1  
 SB20X-BXX-X 2" -11 BS Rp  
 SB30X-AXX-X 3" -8 NPTF -1  
 SB30X-BXX-X 3" -11 BS Rp

Air Inlet

3/4" - 14 NPT (female)

Maximum Air Inlet Pressure

120 PSIG (8.3 bar)

Maximum Material Inlet Pressure

120 PSIG (8.3 bar)

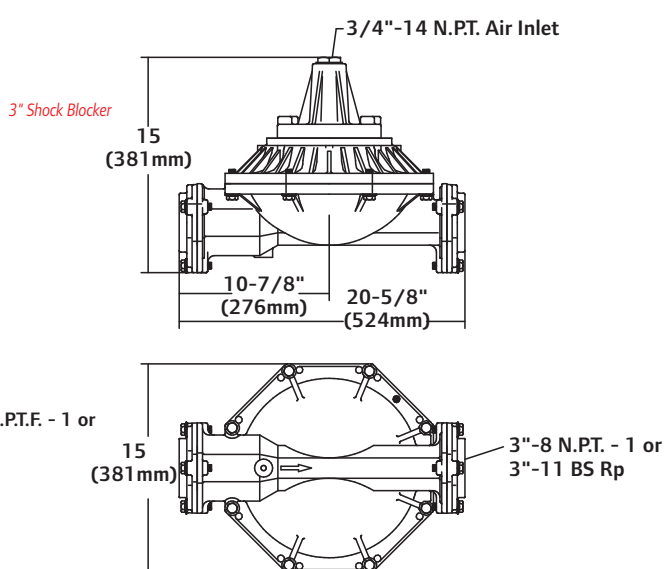
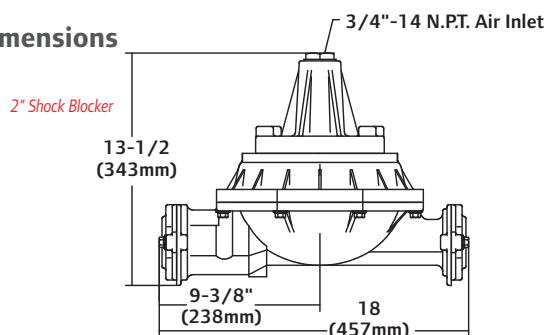
Maximum Temperature Limits

200° F (93° C)

Maximum Fluid Volume

SB20X 159 in.<sup>3</sup> (2.61 lit.)  
 SB30X 509 in.<sup>3</sup> (3.84 lit.)

## Dimensions



## Ordering

| Position | 1  | 2  | 3 |   | 4 | 5 | 6 |   | 7 |
|----------|----|----|---|---|---|---|---|---|---|
| Example: | SB | XX | X | - | X | X | X | - | X |

| Position 1<br>Model Series | Position 2<br>Size | Position 3<br>Air Body                                | Position 4<br>Thread | Position 5<br>Fluid Construction                     | Position 6<br>Hardware                  | Position 7<br>Diaphragm                                |
|----------------------------|--------------------|-------------------------------------------------------|----------------------|------------------------------------------------------|-----------------------------------------|--------------------------------------------------------|
| SB- Shock Blocker          | 20 - 2"<br>30 - 3" | A - Aluminum<br>C - Cast Iron*<br>S - Stainless Steel | A - NPT<br>B - BSP   | A - Aluminum<br>C - Cast Iron<br>S - Stainless Steel | S - Stainless (304)<br>P - Plated Steel | A - Santoprene<br>G - Nitrile<br>T - PTFE<br>V - Viton |

\* Available with 2" model only

# 2" Non-Metallic Shock Blocker

Automatically reduces the pressure fluctuation found in normal diaphragm pump operation and can help eliminate material foaming, hydraulic shock or material splashing.



## Automatic Shock Blocker®

- **Automatic Air Adjustment** - compensates for fluctuations in fluid pressure without operator intervention.
- **Significant Pulsation Reduction** - Shock Blockers deliver an average 60% - 80% pulsation reduction in high back pressure applications.
- **Built for high-flow/aggressive fluid applications** - contains up to 0.9 Gal (3.38L) of fluid volume.
- **Broad Material Range for Compatibility**, Polypropylene fluid section with a choice of PTFE, Santoprene, Viton or Nitrile diaphragms for optimum fluid compatibility.
- **Perfect for Process Applications** - pulsation reduction in long piping runs help prevent costly fluid pipe and downstream valve damage.
- **Bolted construction** - for leak-free vessel integrity and a safer work-site.
- **Ultra-Rugged Construction for long service life**- both inside and out, the Shock Blockers are built tough to deliver worry-free, near pulse-free fluid handling.

## Ordering

| Position | 1    | 2 |   | 3 | 4 | 5 |   | 6 |
|----------|------|---|---|---|---|---|---|---|
| Example: | SB20 | P | - | X | P | S | - | X |

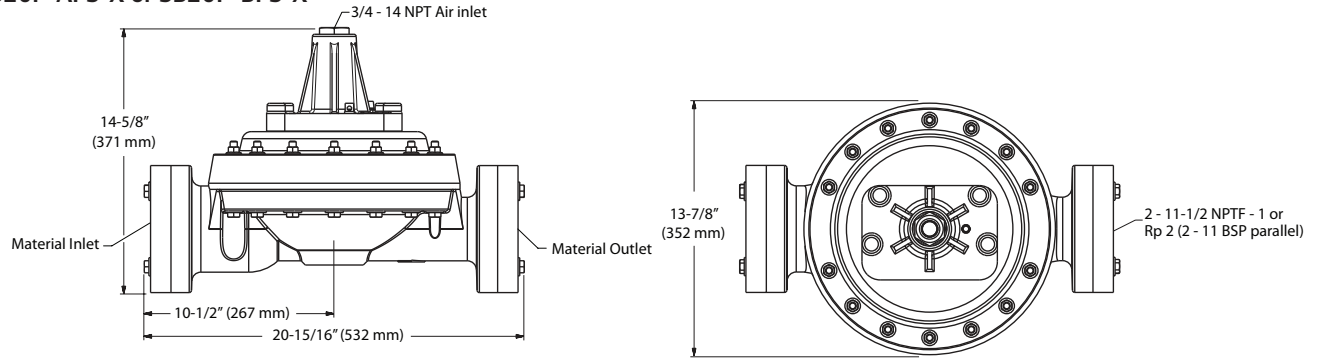
| Position 1<br>Model and Size | Position 2<br>Air Section                                               | Position 3<br>Fluid Connection                                                                                                                                                            | Position 4<br>Fluid Section | Position 5<br>Hardware | Position 6<br>Diaphragm Material                                      |
|------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------------|-----------------------------------------------------------------------|
| SB20 - 2"                    | P - Polypropylene/<br>Aluminum<br>R - Polypropylene/<br>Stainless Steel | A - 2-11-1/2 NPTF-1<br>B - Rp 2 (2-11 BSP, parallel)<br>F - 2" ANSI/DIN Flange Inlet and Outlet<br>K - 2" ANSI/DIN Flange Inlet/ NPTF Outlet<br>L - 2" ANSI/DIN Flange Inlet/ BSPP Outlet | P - Polypropylene           | S - Stainless Steel    | A - Santoprene®<br>G- Nitrile<br>T - PTFE / Santoprene®<br>V - Viton® |

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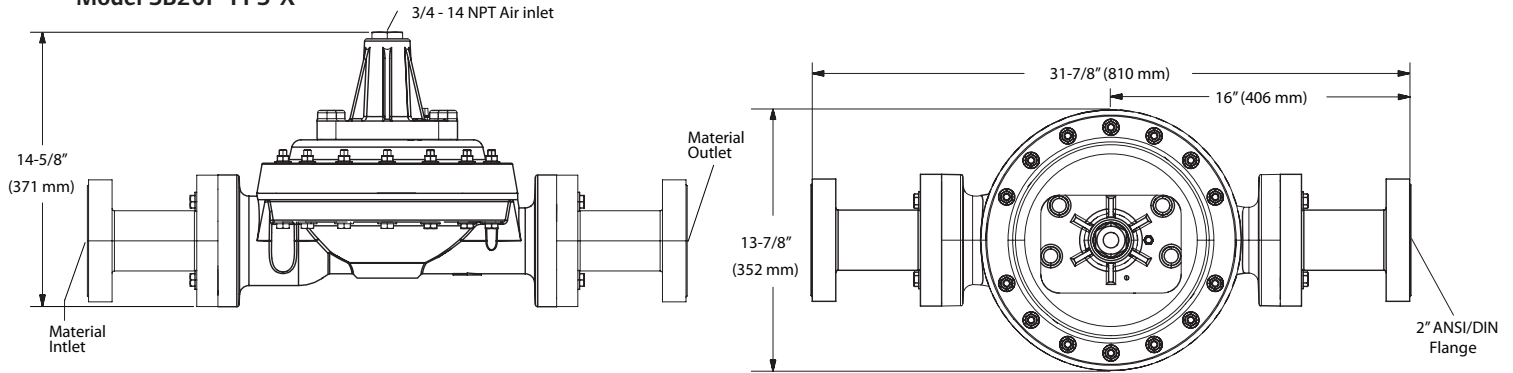


▀ **Dimensions** *Dimensions shown are for reference only, they are displayed in inches and millimeters (mm).*

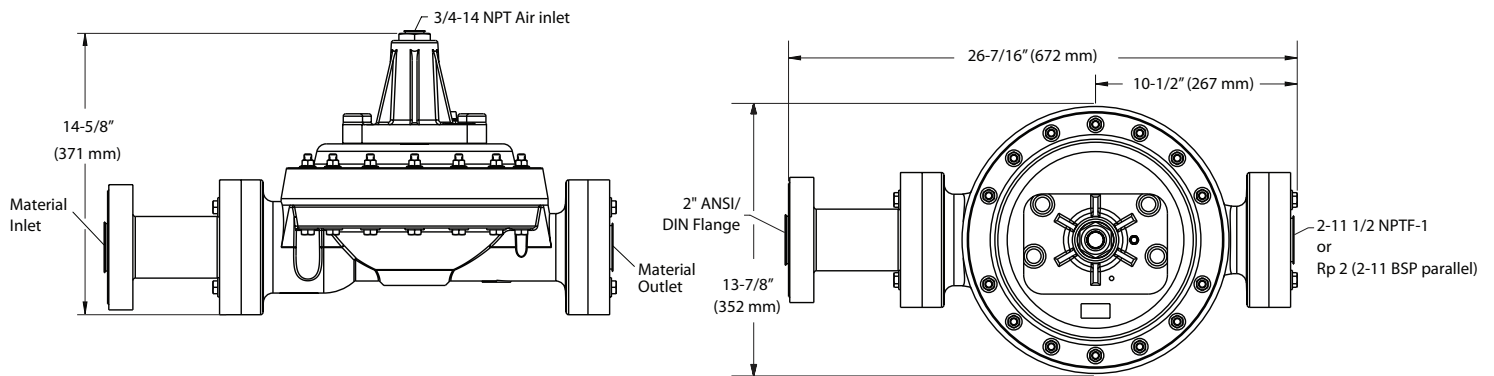
**SB20P-APS-X or SB20P-BPS-X**



**Model SB20P-FPS-X**



**SB20P-KPS-X or SB20P-LPS-X**



# Accessories

## Air Filter/Regulator

The ARO-FLO Series units extend the life of air operated equipment while reducing operating costs. These units efficiently remove solid particles from compressed air lines - making them the great choice for large flow applications.



P39224-614



P39124-600

## Piggyback Filter/Regulator, Metal Bowl w/ Sight Glass, Auto Drain

| Pump Size    | NPT Model Number | Port Size | Max Inlet Pressure (psi) | Pressure Range (psi) | Max CFM | Micron Element | Size HxWxD (inches) |
|--------------|------------------|-----------|--------------------------|----------------------|---------|----------------|---------------------|
| 1/4" to 3/4" | P39124-624       | 1/4"      | 250                      | 0-140                | 47      | 5              | 6.9 x 2.9 x 2.9     |
| 1"           | P39224-614       | 1/4"      | 250                      | 0-140                | 72      | 5              | 9.0 x 2.2 x 3.2     |
| 1-1/2"       | P39344-614       | 1/2"      | 250                      | 0-140                | 172     | 5              | 10.9 x 2.8 x 3.2    |
| 2"           | P39354-614       | 3/4"      | 250                      | 0-140                | 173     | 5              | 10.9 x 2.8 x 3.2    |
| 3"           | P39454-614       | 3/4"      | 250                      | 0-140                | 236     | 5              | 14.7 x 3.5 x 4.1    |

## Piggyback Filter/Regulator, Poly Bowl w/Guard, Manual Drain

| Pump Size    | NPT Model Number | Port Size | Max Inlet Pressure (psi) | Pressure Range (psi) | Max CFM | Micron Element | Size HxWxD (inches) |
|--------------|------------------|-----------|--------------------------|----------------------|---------|----------------|---------------------|
| 1/4" to 3/4" | P39124-600       | 1/4"      | 150                      | 0-140                | 47      | 5              | 6.2 x 2.9 x 2.9     |
| 1"           | P39224-600       | 1/4"      | 150                      | 0-140                | 72      | 5              | 8.1 x 2.2 x 3.2     |
| 1-1/2"       | P39344-600       | 1/2"      | 150                      | 0-140                | 172     | 5              | 10.0 x 2.8 x 3.2    |
| 2"           | P39354-600       | 3/4"      | 150                      | 0-140                | 173     | 5              | 10.9 x 2.8 x 3.2    |

Cautions of the Use of Polycarbonate Plastic Bowls - Use Only with Compressed Air. Filters and lubricators with polycarbonate plastic bowls are specifically designed for compressed air service, and their use with any other fluid (liquid or gas) is a misapplication. Avoid Harmful Substances. Some compressor oils, chemical cleaners, solvents, paints, and fumes will attack plastic bowls and can cause bowl failure. Do not use with or near these materials. Consult the factory with any questions.



Ingersoll Rand attests that ARO®-Flo Series of filters, regulators, lubricators (1000, 1500, 2000, 3000 Series) and select accessories are out of scope for ATEX Directive 94/9/EEC or 2014/34/EU. The products listed in IRITS-1215-197 certificate can be used in group II, category 2 environment; Gas and Dust with temperature a T6 (Ex II 2GD T6) if all conditions set up in the Instruction Manual are met. Instruction Manuals and certificate regarding ATEX Declaration can be found at [AROZONE.COM](http://AROZONE.COM)

## Air Control Actuation Valves

3-way valve controls air supply to pump. Activation starts pump, deactivation cuts off air supply to pump and exhausts air from motor, which prevents stalling.

MQ3728-120-A for 1/2" and 1" pumps,

H2545S-120-A for 1-1/2" pumps,

MQ3729-120-A for 2" and 3" pumps

24 VDC MQ3728-024-D for 1/2" and 1" pumps

H2545S-024-D for 1-1/2" pumps

MQ3729-024-D for 2" and 3" pumps



MQ3728-120-A used on 1/2" and 1" pumps



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## About Ingersoll Rand

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