

OPERATOR'S MANUAL

SBGXXX-XXX-X

INCLUDING: OPERATION, INSTALLATION AND MAINTENANCE

RELEASED: 5-8-26
REVISED: 9-1-26
(REV: B)

1" SHOCK BLOCKER

**READ THIS MANUAL CAREFULLY BEFORE INSTALLING,
OPERATING OR SERVICING THIS EQUIPMENT.**

It is the responsibility of the employer to place this information in the hands of the operator. Keep for future reference.

PUMP DATA

Dampener Type Adjustable / Passive
damping**Materials of Construction:** PVC, PVDF,
GF Polypropylene,
CPVC**Connection Sizes** 1"**Connections** NPT, BSPT, Flange**Gauge Port Sizes** 1/4"**Max Temperature Limits**

PVC 140°F

GF Polypropylene 175°F

PVDF 225°F

CPVC 175°F

Max Operating Pressure (psi) @ 70 (°F)

Plastic 150 psi (10.3 bar)

Metal 300 psi (21 bar)

Bladder Material

EPDM -60°F to +280°F

Hypalon® -20°F to +275°F

PTFE -20°F to +220°F

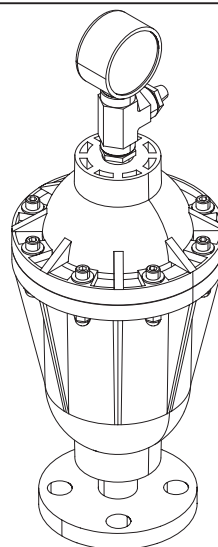
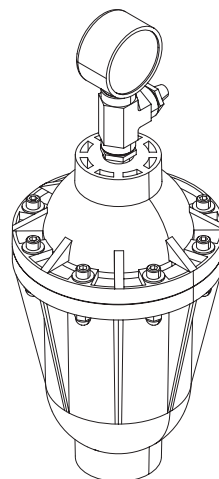
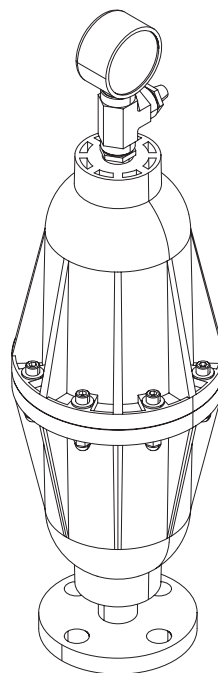
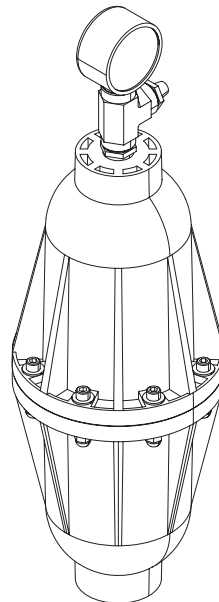
Gauge and Connector**Materials.** 316 SS**Gauge Operating Pressure.** 0 - 160 psi**Dimensional Data.** see page 7

REPAIR KITS

SBGRK108E**SBGRK112E****SBGRK108H****SBGRK112H****SBGRK108T****SBGRK112T**

Includes: Bladder (EPDM, Hypalon®, PTFE - Item #6)

Hardware (Item 1,2,3) (See page #6)

**SBG108-XFP-X****SBG108-XXP-X****SBG112-XFP-X****SBG112-XXP-X****Figure 1****ARO**

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ARO®

MODEL DESCRIPTION CHART

SBG X XX - X X X - X

Inlet Size

1 - 1"

Volume

08 - 80 cubic inches

12 - 125 cubic inches

Housing Material

C - PVC

G - GF Polypropylene

K - PVDF

Y - CPVC

Connection

B - BSPT

F - Flange

N - NPT

Control

P - Passive

Bladder Material

E - EPDM

H - Hypalon®

T - PTFE

INTRODUCTION AND DESCRIPTION

ARO pulsation dampeners are used to enhance the performance for positive displacement pumps and applications like dosing, batching, filling, as well as bulk transfer by minimizing vibrations in the chemical lines and reducing the wear on the chemical feed pump. The dampener operates by having a compressible gas on one side of the diaphragm; the other side is connected to the process fluid. As the pump discharge occurs, the compressed gas absorbs the pressure surge. As the pump moves into the suction stroke, the compressed gas expands forcing liquid out of the dampener and keeps the fluid moving in the discharge line. In this way, the pressure spikes are kept out of the chemical dosing system.

The operation of the pulsation dampener is achieved by applying a pressure equal to 80% of the system pressure to the gas side of the dampener. The dampening effect requires a minimum of 7 to 10 psi downstream pressure. Maximum performance is achieved when the downstream pressure is constant, which can be obtained with the installation of a ARO back pressure valve.

OPERATING AND SAFETY PRECAUTIONS

READ, UNDERSTAND, AND FOLLOW THIS INFORMATION TO AVOID INJURY AND PROPERTY DAMAGE.



⚠ WARNING DAMPENERS SHOULD ONLY BE INSTALLED AND MAINTAINED BY TRAINED PERSONNEL.

- ARO pulsation dampeners guarantee its products against defective material and workmanship only. ARO Valve assumes no responsibility for damage or injuries resulting from improper installation, misapplication, or abuse of any product.
- ARO Pulsation dampeners assumes no responsibility for damage or injury resulting from chemical incompatibility between its products and the process fluids to which they are subjected. Compatibility charts provided in ARO Pulsation dampeners literature are based on ambient temperatures of 70°F and are for reference only. Customers should always test to determine application suitability.
- Consult ARO Pulsation dampeners literature to determine operating pressure, temperature, and flow rate limitations before installing any ARO Pulsation dampeners product. Also note that maximum operating pressure is dependent upon material selection as well as operating temperature. Do not exceed maximum pressure rating.
- This product is designed primarily for use with non-compressible liquids.
- Systems should always be depressurized, flushed and drained prior to installing or maintaining ARO Pulsation dampeners products.
- Before starting a chemical feed system ensure all downstream pulsation dampeners are open and that the ARO Pulsation dampeners relief valve is in working order.
- Do not operate a chemical feed system that has damaged or leaking equipment.
- Temperature effect on piping systems should always be considered when the systems are initially designed. Piping systems must be designed and supported to prevent excess mechanical loading on ARO Pulsation dampeners equipment due to system misalignment, weight, shock, vibration, and the effects of thermal expansion and contraction.
- Due to differential thermal expansion rates between metal and plastic, transmittal of pipe vibration, and pipe loading forces **DIRECT INSTALLATION OF METAL PIPE INTO PLASTIC CONNECTIONS IS NOT RECOM-**

MENDED. Wherever installation of plastic pulsation dampeners into metal piping systems is necessary, it is recommended that at least 10 pipe diameter in length of plastic pipe be installed upstream and downstream of the plastic dampener to compensate for the factors mentioned above.

- ARO pulsation dampeners are designed to operate with compressed air (up to 150 psi), and dry nitrogen only. **DO NOT USE OXYGEN.**
- Ensure internal dampener pressure is released, isolation valves are closed, the chemical feed system is shut down and system pressure released before performing any maintenance or dampener removal.
- When pumping flammable liquids or in a flammable environment, ensure the pulsation dampener and chemical feed system are grounded to avoid possible explosion due to static spark.

⚠ WARNING HAZARDOUS MISUSE OF EQUIPMENT:

- **DO NOT USE OXYGEN TO CHARGE PULSATION DAMPENER.** Misuse could result in injury, death, explosion or property and equipment damage.
- Temperature and pressure limits as outlined in the ARO technical literature and on the equipment label must be adhered to.
- Install the pulsation dampener before charging or pressurizing. Charge the dampener before pressurizing the chemical feed system. Do not over pressurize the dampener.
- Dampener bladders break down over time. Failures allow the system fluid into the air chamber and will cause damage to the charging assembly. Routine maintenance should be performed.
- Do not over tighten dampener at the connection to the chemical feed system. Over tightening can weaken the dampener housing at that point.

⚠ WARNING IMPORTANT INFORMATION:

- Do not use oxygen to charge pulsation dampener due to risk of explosion. Use only compressed air (up to 150 psi), or dry nitrogen.
- Never exceed maximum pressure as indicated on the dampener label.
- Never exceed the maximum temperature as indicated on the dampener label.
- Ensure chemical compatibility before installing and pressurizing dampener.
- Always follow OSHA safety requirements. Wear protective clothing and eye wear when working on any equipment in the chemical feed system.

- Never operate a chemical feed system that has components that are leaking, corroded, damaged or in need of service.
- Refer to the MSDS for all chemicals used.
- Use only Genuine ARO parts for service. Use of other parts may result in damage to equipment or injury and invalidate the warranty.
- Flush all components that are in contact with chemicals prior to servicing.
- Dispose all chemicals and waste according to all local, state and federal regulations.
- Always install a pressure relief valve in the system.

NOTICE Replacement warning label is available upon request.

⚠ WARNING = Hazards or unsafe practices which could result in severe personal injury, death or substantial property damage.

⚠ CAUTION = Hazards or unsafe practices which could result in minor personal injury, product or property damage.

NOTICE = Important installation, operation or maintenance information.

UNPACKING

Units are shipped FOB factory and the title passes to the customer when the carrier signs for the receipt of the unit. In the event damages occur during shipment, it is the responsibility of the customer to notify the carrier immediately and to file a damage claim.

Check all orders for completeness against the packing list. Notify ARO immediately if any deficiencies are found.

⚠ WARNING Turn off and lock out the chemical feed pump. Bleed off all pressure from the system before starting to install the dampener.

- Remove any pressure from the dampener.
- Use compressed air (up to 150 psi) or dry nitrogen to charge the dampener. **DO NOT USE OXYGEN.**
- Do not exceed the maximum allowable pressure for the dampener as stated on the dampener label.
- Always follow OSHA procedures and wear protective eye wear and clothing.
- Charge dampener to 80% of system pressure before testing.
- It is not recommended threading metal pipe or pipe fittings into plastic components.

⚠ CAUTION Plastic materials lose tensile strength as temperatures rise. This reduces the maximum working pressure of the dampener. Appropriate derating factors must be applied to the maximum working pressure when operating above 75° F. Where the risk of fire exists that could potentially cause the pre-charge gas to rise above the maximum working pressure rating a relief device must be installed on the gas side of the dampener.

- Prior to installation: check that the connection is the right size. Review the specification on the dampener tag to validate the correctness of the model size, material and pressure.

INSTALLATION

As a general rule, installation should follow the layout as outlined in the TYPICAL INSTALLATION drawing.

The dampener should be installed as close to the pump discharge as possible, but downstream of the pressure relief valve. Generally, the dampener should be mounted in the vertical position, either way up, however it will work in a horizontal position. Keep the piping as short as possible as longer pipe lines will reduce dampening effectiveness.

Dampeners should be mounted with a support bracket whenever possible and always when using flexible tubing.

Mount a pressure gauge downstream of the dampener and before the installation of an ARO back pressure valve. The adjustable back pressure valve will ensure a constant upstream pressure and will facilitate the fine adjustment of the pressure to minimize the pulsations from the pump.

Pre-charge the dampener to 80% of the anticipated injection pressure (Compressed air to 150 psi, not to exceed pressure rating of the dampener), and replace the air valve cap, hand tighten. Using a soapy solution check the charging assembly and connection to the dampener for any air leaks. If no leaks are present, check that all downstream valves are open; then turn on chemical feed pump.

Check the gauge installed between the dampener and the back pressure valve. It should initially bounce as pressure is built up and stabilize once the charge pressure is equalized. Use the back pressure valve adjustment screw to fine tune the dampening effect. If a back pressure valve is not installed adjust the air pressure to minimize the needle movement.

CONNECTION DRAWING

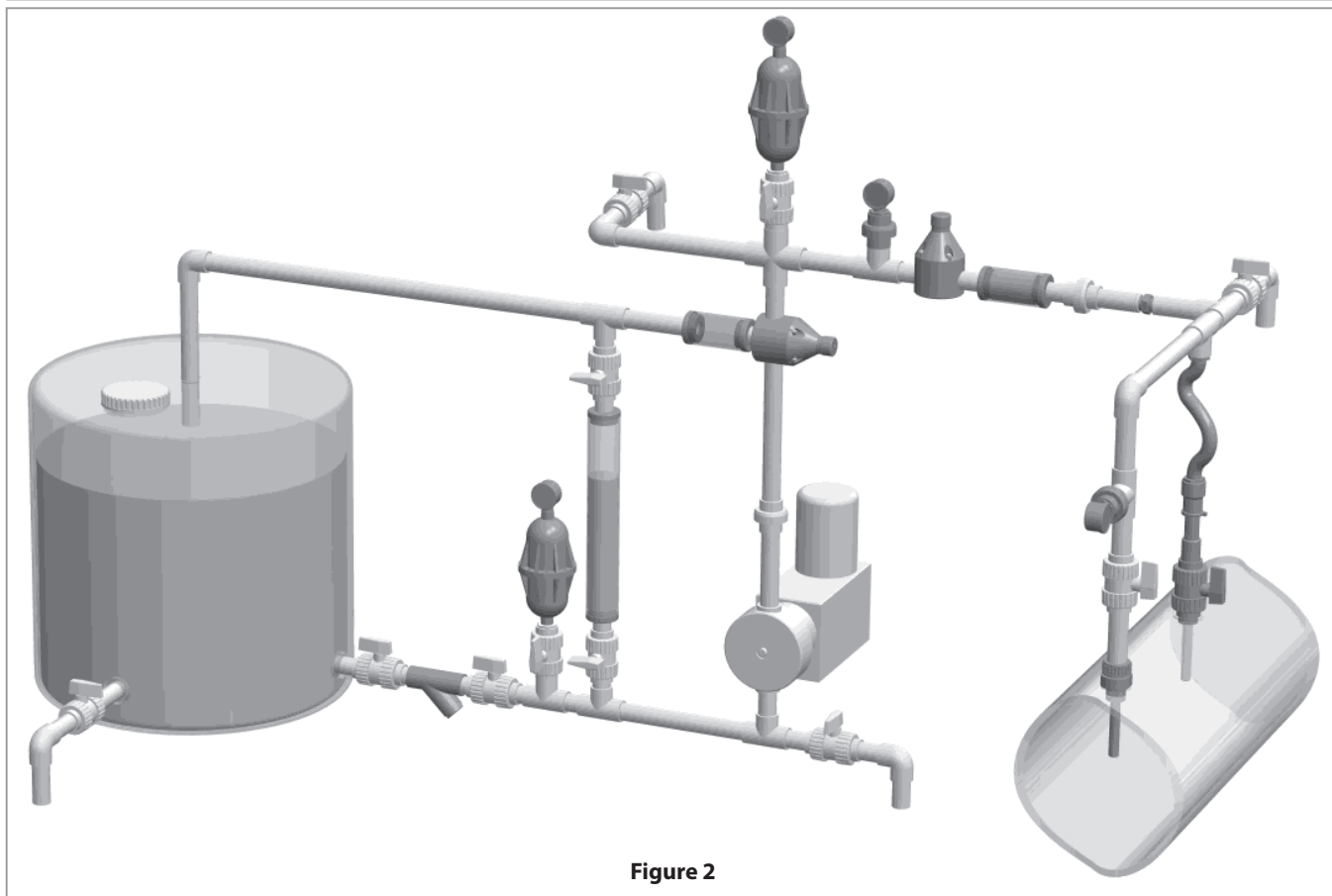


Figure 2

MAINTENANCE

ARO pulsation dampeners were designed with a minimum amount of maintenance required to keep the equipment in operation. However, periodic replacement of the bladder is required.

The ARO design permits routine inspection and repair without removing the dampener from the pump line, provided an isolation valve is installed.

⚠ CAUTION Ensure that the chemical feed system is not under pressure and in the absence of an isolation valve, that the chemical lines have been flushed with water before starting disassembly. Always wear protective clothing and eye wear when working on the chemical feed system.

- Use only genuine ARO parts in your ARO Dampener.

DISASSEMBLY

If an isolation valve is installed ensure it is open; then increase the pressure in the dampener to 5 psi higher than the system pressure. This will force most of the chemicals out of the dampener. Close the isolation valve. Release the air from the dampener via the charging assembly.

If an isolation valve is not installed, depressurize the entire chemical feed system, drain the system and flush with water. Release the air from the dampener via the air charging system. Check the pressure gauge to ensure it is reading zero pressure.

Undo the 8 bolts holding the 2 halves of the dampener together. Lift the top half of the dampener off and remove the bladder.

⚠ CAUTION Use only genuine ARO parts in your ARO Dampener.

REASSEMBLY

If applicable place a small amount of lubricate (No Silicone) on the bladder seat of both the top and bottom halves of the dampener.

Place the bladder into the bottom half of the dampener. (The side connected to the chemical feed system). Replace the top half of the dampener, ensuring the bladder o ring is correctly positioned. It is strongly recommended that nuts and bolts be replaced every time the dampener is disassembled for maintenance or inspection. Reinstall the bolts and nuts and torque in a star (criss-cross) pattern. Final torque depends on bladder material.

- Elastomer bladders (EPDM, Hypalon®, Viton): 6 ft-lb
- PTFE bladders, plastic housing: 8 ft-lb
- PTFE bladders, metal housing: 15 ft-lb

For PTFE bladders, see the Re-Torque Schedule below; re-torque is mandatory.

PTFE exhibits cold flow and will relax under sustained load. Re-torque all bolts to final spec at the following intervals: 24 hours after install, 1 week after install, and quarterly during scheduled maintenance.

Depressurize before each re-torque; pressure-test after. Skipping the re-torque schedule will cause flange leaks during service."

With the isolation valve still closed pre-charge the dampener via the charging assembly to 80% of the anticipated system pressure. Use compressed air up to 150 psi, dry nitrogen for pressures above 150 psi. DO NOT USE OXYGEN due to risk of explosion.

Using a soapy solution check the charging assembly and connection to the dampener for any air leaks. If no leaks are present check that all downstream valves are open; then turn on chemical feed pump.

Once the chemical feed system is up to pressure open the isolating valve under the pulsation dampener. Using the back pressure valve, adjust the upstream pressure to maximize the dampening effect.

PARTS LIST / SBGXXX-XXX-X

Item	Description (size)	Qty	Item	Description (size)	Qty
1	Stainless Steel Bolt (1/4 - 20 X 1 3/8") (Included in kit)	8	6	Bladder - EPDM (for 80 and 125 cu in dampener)	1
2	Cap hex nut (1/4-20) (Included in kit)	8		Bladder - PTFE (for 80 and 125 cu in dampener)	
3	Flat washer (1/4 -20) (Included in kit)	16		Bladder - Hypalon® (for 80 and 125 cu in dampener)	
4	Gauge (0 - 160 psi)	1	7	Upper housing	1
5	Charging Assembly (1/4" connection 316 SS)	1	8	Lower housing	1

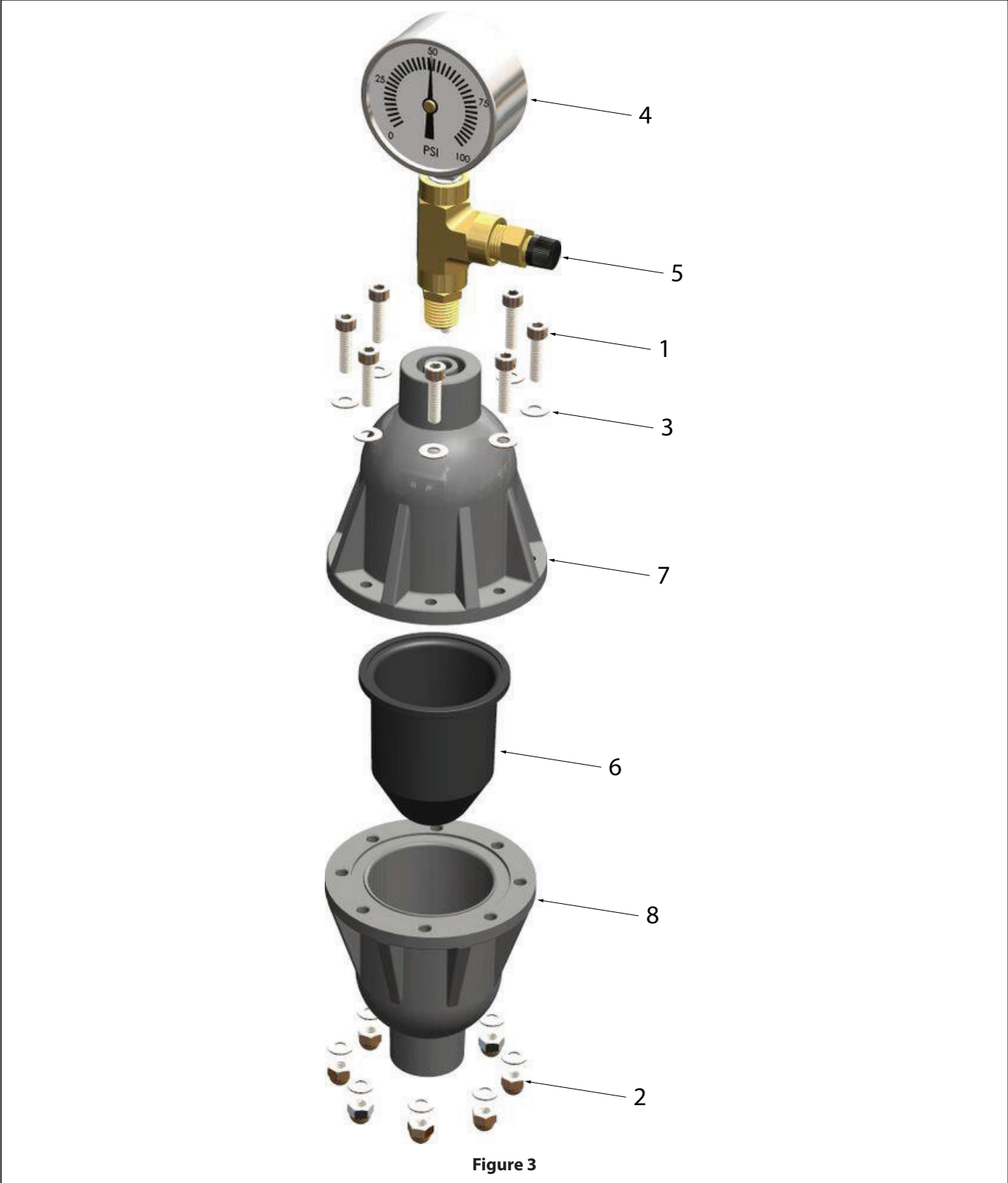
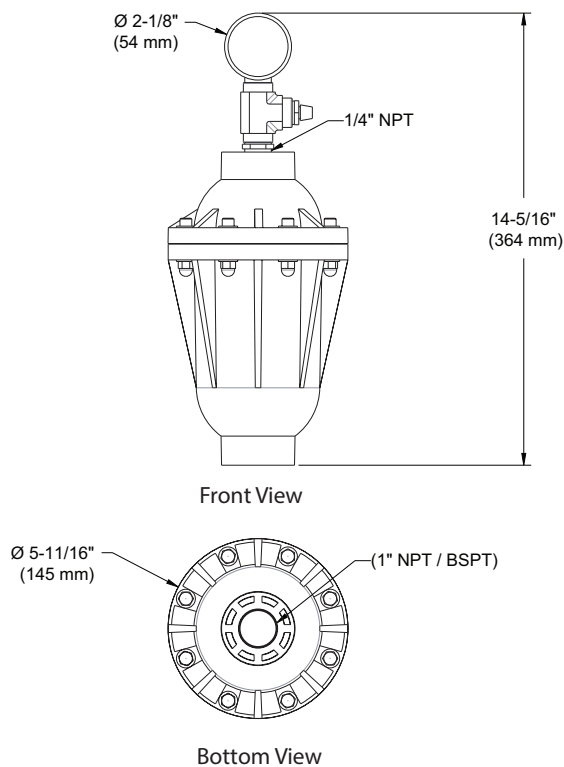
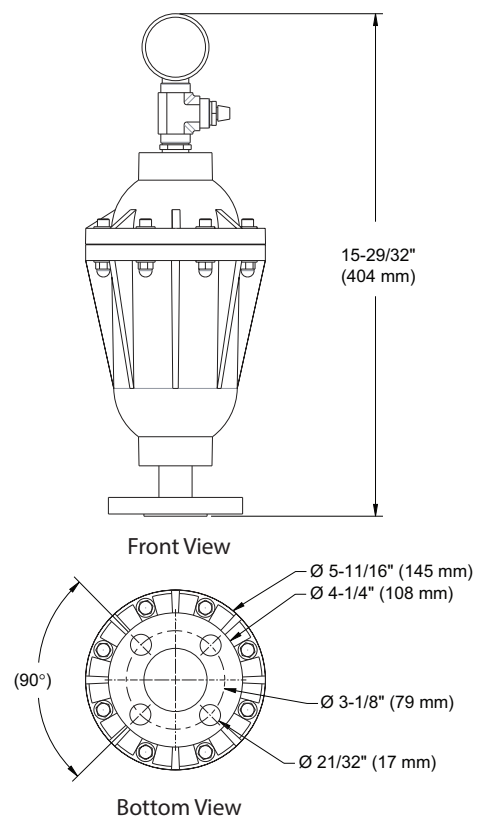
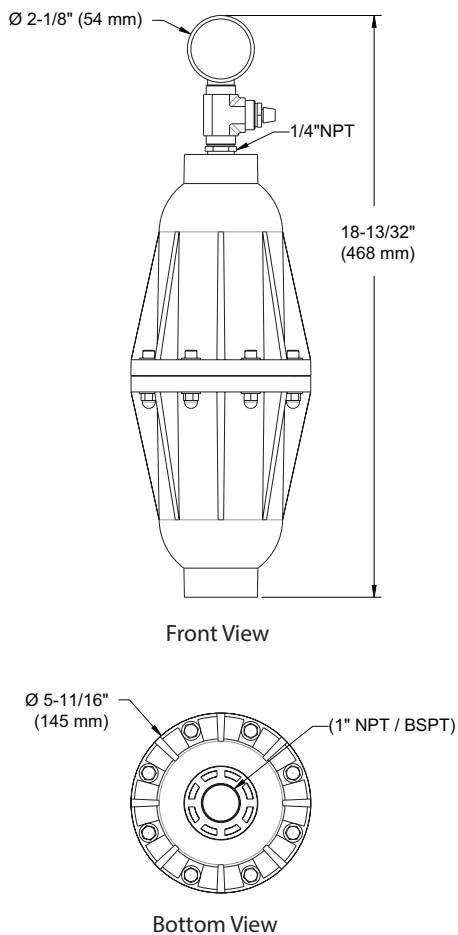
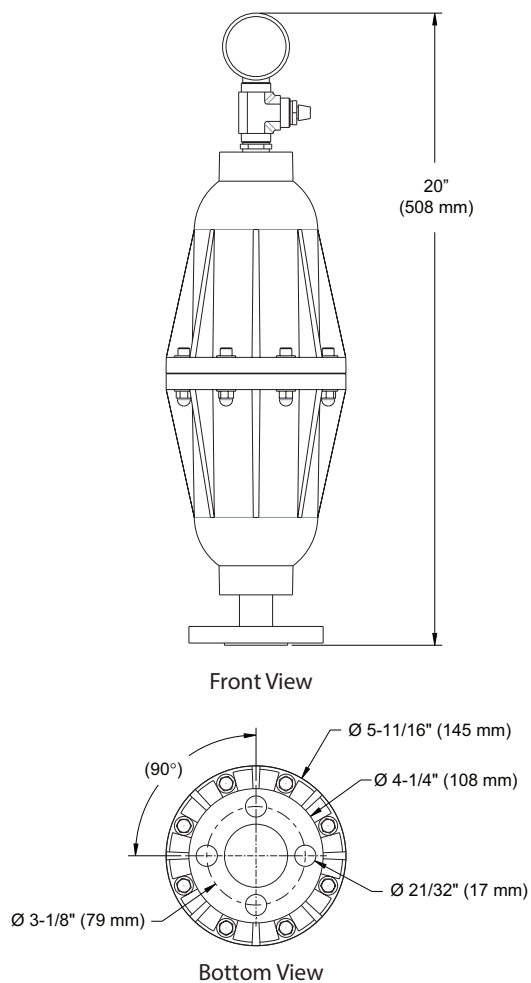


Figure 3

DIMENSIONAL DATA**SBG108-XNP-X****SBG108-XFP-X****SBG112-XNP-X****SBG112-XFP-X****Figure 4**

LIMITED WARRANTY

ARO warrants that its products, produced at its facility, shall be free from defects in material and workmanship for a period of one year under normal use or eighteen (18) months from date of shipment, which first occurs. Defects caused by shipment, improper installation, negligence, misuse or alterations by parties other than ARO are not covered by this limited warranty. This limited warranty is extended only to the original purchaser from ARO.

This warranty does not extend to damage by corrosion or erosion. The materials of construction offered are recommendations subject in all cases to acceptance by the customer. These recommendations, based on previous experience and best available information, do not constitute guarantees against wear or chemical action. No liability for consequential damages or re installation labor is accepted. ARO will not assume responsibility for contingent liability for alleged failure of its products.

The purchaser must promptly notify ARO of any claimed defect. Products may only be returned to ARO upon purchaser's receipt of written consent from ARO. Products are to be returned to ARO with freight prepaid. If ARO inspection shows the products to be defective, ARO liability in respect of defective products shall be to repair or replace such item(s) in its discretion.

EXCEPT FOR THE EXPRESS LIMITED WARRANTY SET FORTH HERE, NO OTHER IMPLIED WARRANTIES OF ANY KIND, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, ARE HEREBY DISCLAIMED. ARO SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES.

ARO MAXIMUM LIABILITY SHALL NOT IN ANY EVENT EXCEED THE CONTRACT PRICE FOR THE PRODUCT.