

# SAFE Systems, Inc.

Kent, WA  
425-251-8662



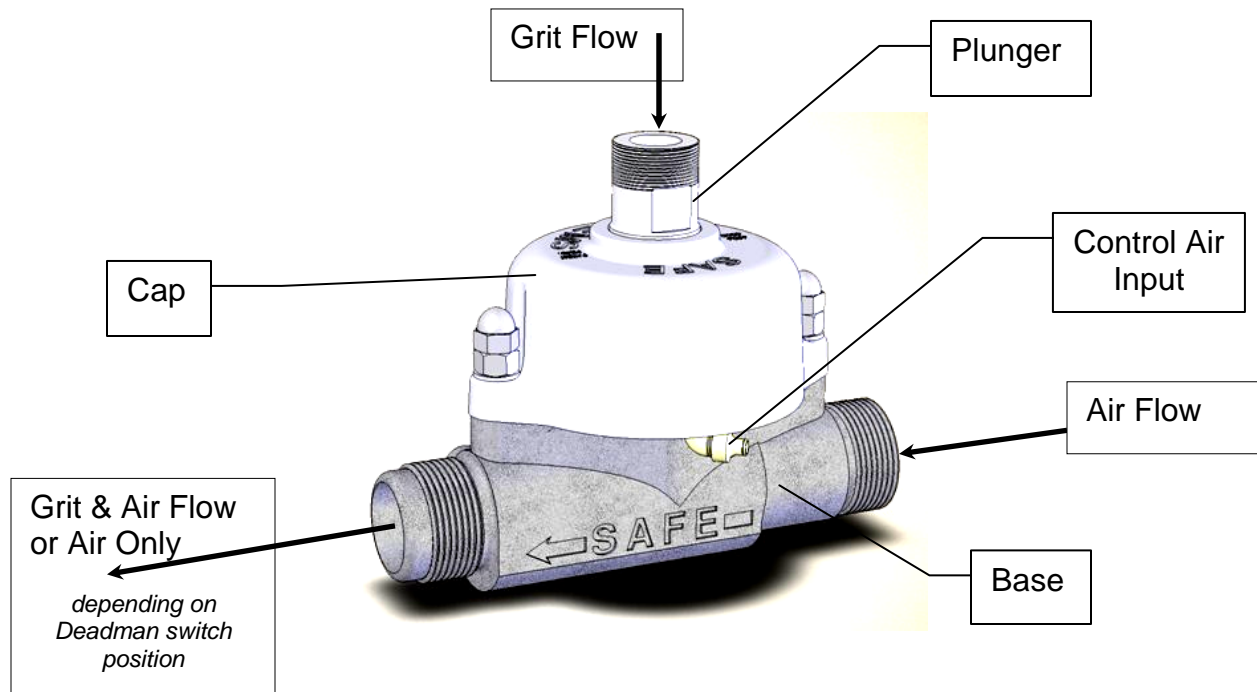
**VALVE**

## Overview:

The S4C valve is both a normally closed grit shut-off valve and a grit metering valve. Without control air, the valve is closed, grit flow is shut off. The valve uses a spring to depress the plunger and compress the rubber washer, providing complete shut-off of grit and air from the pot when there is no air pressure applied to the valve's control air input. When air pressure is applied to the valve's control air input, the plunger moves to relieve pressure on the rubber washer. The amount (psi) of control air applied to the valve meters the grit flow.

A pressure regulator (usually mounted to the main control box), allows the user to adjust the grit flow by adjusting the air pressure. The air pressure acts against the spring via the plunger when the valve is in the "on" (metered grit flow) state. A higher pressure setting at the regulator will provide a higher grit flow rate because the size of the hole in the rubber washer increases. Typically, the rubber washer will be fully open at about 100 psi, measured at the control air input. The S4C valve body is rated for 150 psi. A fully functioning S4C valve system includes a separate actuated air valve and a special deadman switch to allow a "blowdown" feature. This allows the operator to instantly switch from blasting (grit and air) to "blowdown" (air only).

*Note: Operators may be familiar with earlier model metering valves where the grit flow rate was adjusted by tightening or loosening the hex nuts holding the cap. The metering valves were commonly used with pinch valves. The hex nuts on the S4C valve are NOT used to adjust grit flow. When the valve is in use, the hex nuts must always be tightened until the cap is clamped tight against the base. If the cap is not tight against the base, a complete shut-off may not be obtained when the valve is in the "off" position. This can lead to excessive wear, premature valve failure and a blast hose packed with grit. DO NOT ATTEMPT TO ADJUST THE GRIT FLOW BY LOOSENING THE NUTS.*



**WARNINGS:** Do NOT loosen the hex nuts holding the cap in an attempt to adjust grit flow. Grit flow is adjusted ONLY by means of the pressure regulator on the control box. Loosening the nuts may lead to excessive wear and premature valve failure.

Do NOT rotate the valve body in relation to the plunger unless pressure on the rubber washer has been relieved, either by applying air to the control air input or by loosening the hex nuts. Rotating the body independently of the plunger WILL damage the rubber washer.

Do NOT exceed 100 psi air pressure at the control air input. Exceeding 100 psi may damage the failsafe spring system which shuts off the grit.

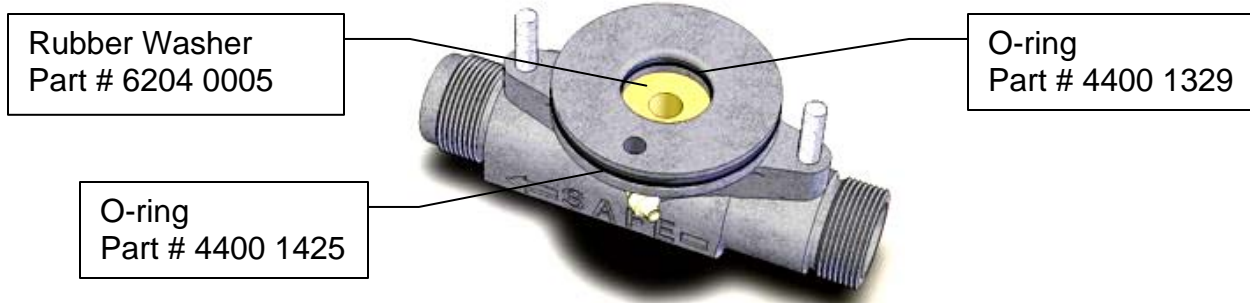
Remove control air tubing from the control air inlet before attempting to loosen the nuts to open the valve for repairs.

Do NOT remove the hex nuts or open the valve for repairs until you have thoroughly cleaned the valve and surroundings. Grit will damage the threads and grit that enters the valve can damage internal parts.

Do NOT leave the threads of the studs uncovered when reassembling the valve after repairs. Replace both the hex nuts and the acorn nuts to protect the threads from damage.

## Replacing the rubber washer:

Indications: When the rubber washer approaches the end of its service life, the operator may begin to notice a small volume of air leaking out of the blast nozzle when the valve is in the “off” position. Initially, the leaking should not create a safety problem. When this symptom is noticed, the operator may continue blasting through the end of the shift but should plan on replacing the washer prior to the start of the next shift. This washer will typically last 200 to 300 hours.



To replace the rubber washer, the valve base must be dropped from the cap.

*Note: Do not attempt to rotate the valve base in relation to the plunger unless the load has been removed from the spring or damage to the rubber washer may occur.*

- Clean any abrasive and dirt from the valve as completely as possible.
- Remove the air tubing from the push-to-fit fitting on the control air input.
- Using a  $\frac{3}{4}$ " deep-well socket, remove the two acorn nuts.
- Loosen the two (2) hex nuts, alternating from one nut to the other every turn, so that the base drops evenly and does not bind within the cap.

*Note: When the hex nuts are near the top ends of the studs, the spring will be relaxed so there is no need to worry about the spring throwing the base from the cap.*

- Remove the hex nuts and steel washers and drop the base from the cap. Be careful to keep abrasive from getting on the threads.

Now, the old washer may be pried from the base.

- Using a screwdriver or similar tool pry out the old rubber washer, using care to avoid scarring the o-ring or valve base.
- Clean the valve base, paying special attention to where the rubber washer and outer O-ring sit, to remove any grit or debris.
- Clean the inside of the cap. Compressed air may be used to blow off the base and underside of cap.

Reassemble the valve in the opposite order as it was disassembled.

- Install a new rubber washer
- Tighten the hex nuts securely, clamping the base to the cap to ensure proper and safe operation. *Remember to alternate between hex nuts every turn so that the base is cinched up evenly and does not bind.*
- Replace the acorn nuts to protect the threads from grit.