



# Chemical Injection Technologies

## Product/Specification Bulletin

### SUPERIOR™ Modular Automatic Switchover Gas Sulfonator, Series SD-15 Direct Cylinder Mounted - All Vacuum

#### GENERAL DESCRIPTION

The SUPERIOR™ Series SD-15 Modular Automatic Switchover Gas Sulfonator is a state-of-the-art, totally vacuum-operated system designed to automatically switch Sulphur Dioxide feed from an empty cylinder to a full cylinder. The Series SD-15 allows round-the-clock Sulfonation without being concerned about running out of Sulphur Dioxide when the system is unattended. Series SD-15 Sulfonators are of the vacuum-operated solution feed type designed to mount directly on Sulphur Dioxide cylinder valves. A vacuum operated switchover module is mounted on the wall and connected to both Sulphur Dioxide vacuum regulators. A Sulphur Dioxide gas flow meter panel indicates the amount of Sulphur Dioxide being fed and may be located wherever it is safest and most convenient. Sulphur Dioxide flow rate is manually adjusted and the design permits easy addition of a number of automatic flow rate control devices. A high efficiency, water operated ejector produces the vacuum necessary to operate the system. The ejector assembly contains a back-flow check valve system to prevent pressurized water from entering the Sulfonator. A spring-opposed diaphragm vacuum regulator controls the Sulphur Dioxide gas flow rate and also acts as the safety shut-off valve.

#### FEATURES

The SUPERIOR™ Series SD-15 represents the most modern design technology coupled with the very best materials available to create an outstanding, user friendly piece of equipment. It is designed with user safety as a primary concern.

1. A new ultra-thick, fluoroplastic yoke coating gives SUPERIOR™ corrosion resistance, won't crack, peel or chip.
2. All molded parts are designed for SUPERIOR™ strength, warp-resistance and Sulphur Dioxide resistance.
3. The rate valve "Seat" is pure fluoroplastic and will not swell, stick or become brittle with age or exposure to liquid Sulphur Dioxide.
4. All external bolts and nuts are Titanium for complete corrosion resistance..a SUPERIOR™ exclusive.
5. Extra heavy-duty outlet threads on the ejector diffuser prevents breakage from over-tightening or "bumping" of the ejector assembly.
6. Easier to service and perform routine maintenance, with standard size wrench lugs provided on all screwed-together ejector parts.
7. All vacuum fitting holes are heavily reinforced to prevent the possibility of cracking from over-tightening fittings.
8. "Dual-pressure" check valve is standard on all SUPERIOR™ gas Sulfonators. Proven high back-pressure unitized check valve design protects against sudden surges up to 300 PSIG while a spring-loaded diaphragm check provides positive shutoff even when there is no back-pressure to force the seat closed.
9. Switchover Module has been totally re-designed to prevent sticking, misalignment or wear on internal parts. Up to 20% fewer parts than other designs means greater reliability.

10. Automatic Reset - The SUPERIOR™ Modular Automatic Switchover Gas Sulfonator system requires no manual reset of the switchover module once empty source is replaced with a new source.

11. Fewer parts, combined with SUPERIOR™ materials and a SUPERIOR™ design gives you a SUPERIOR™ Gas Sulfonator.

#### FLOW METER CAPACITIES

SUPERIOR'S modular design concept allows the Sulphur Dioxide gas indicating meter and flow rate control valve to be located wherever it is most convenient for the operator, and also in the safest location. Variable area flow metering tubes are available with dual English/Metric scale maximum capacities of 0.8, 1.5, 4, 10, 25, 50 and 100 pounds per 24 hours of Sulphur Dioxide gas, as well as 15, 30, 75, 200, 500, 1000 and 2000 grams per hour, respectively. All metering tubes are interchangeable and may be changed in the field without special tools.

#### MATERIALS OF CONSTRUCTION

One of SUPERIOR™S major competitive advantages is the use of the finest, strongest and most durable materials available. Extensive use of Fluoroplastics and fiberglass reinforced ynthermo-plastics allow SUPERIOR™ Gas Sulfonators to withstand attack by Sulphur Dioxide in any form and to give the longer operational life. Many parts are *guaranteed for the life of the equipment* against Sulphur Dioxide damage.

#### SYSTEM OPERATION

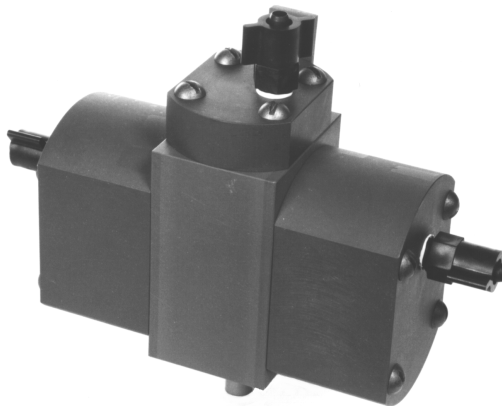
The vacuum regulators are securely clamped onto the Sulphur Dioxide cylinder valves. Vacuum tubing connects each regulator to the wall mounted automatic switchover module. A single piece of vacuum tubing connects the outlet of the

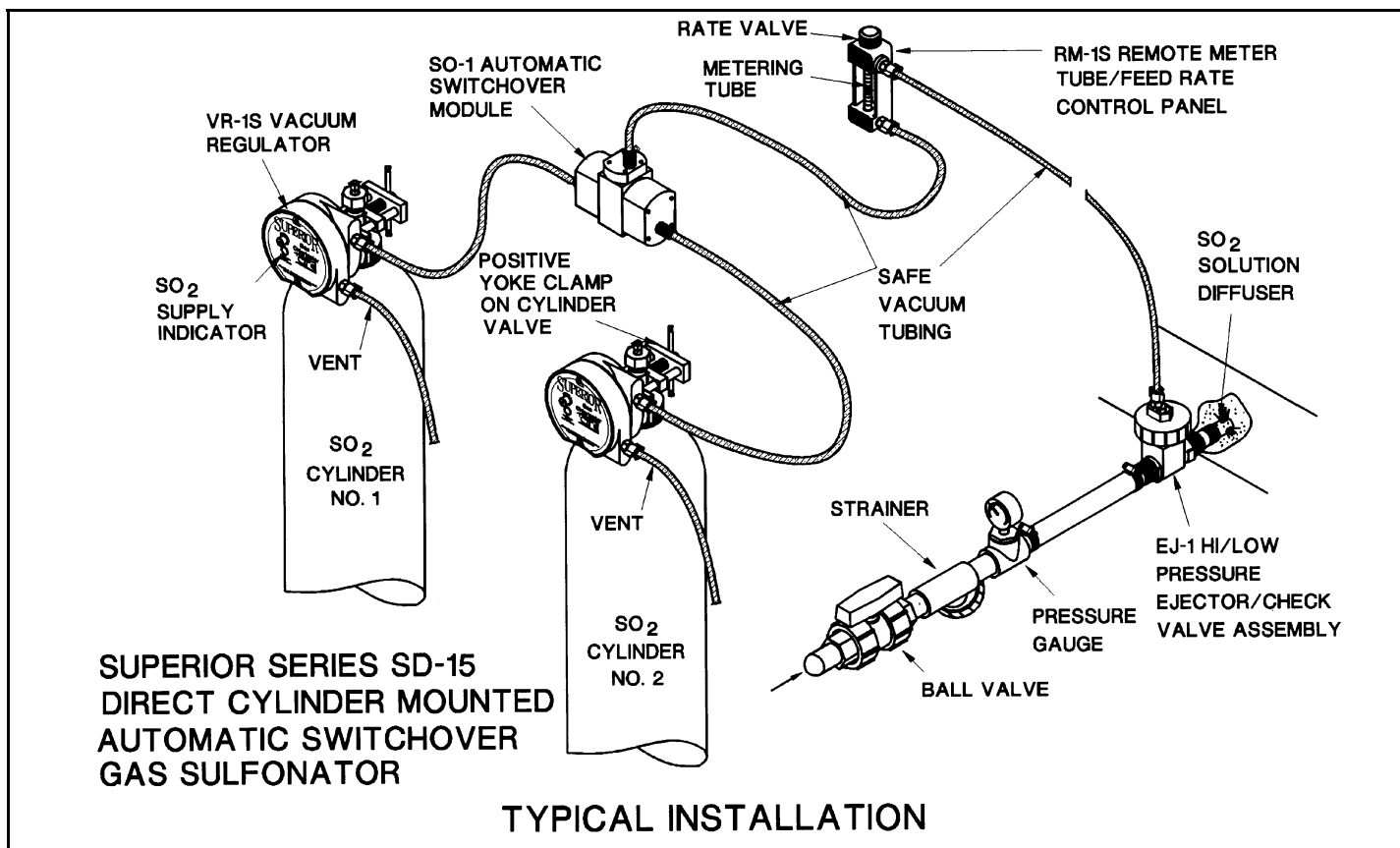
module to the wall mounted remote meter tube/rate valve panel. The ejector is connected to the remote meter panel with a single piece of vacuum tubing.

Water under pressure flows through the ejector at high velocity causing a strong vacuum to be created. This opens the check valves in the ejector assembly and transmits a vacuum signal through the remote meter tube/rate valve panel, through the switchover module and back to the vacuum regulator. When the vacuum reaches a pre-set level, the diaphragm in the regulator moves, opening the Sulphur Dioxide inlet safety valve, and permits gas to flow from the Sulphur Dioxide cylinder. The spring-opposed diaphragm and inlet valve regulate the vacuum at this point.

Sulphur Dioxide gas passes through the automatic switchover module, remote flow meter panel and rate control valve to the ejector. The gas mixes with the ejector water and is discharged through the diffuser into the water being treated.

When the Sulphur Dioxide supply is depleted in one source, vacuum starts to increase in the system creating a differential across the diaphragm in the switchover module. This overcomes a spring loaded toggle assembly and the unit then switches over permitting Sulphur Dioxide gas to flow from the full source.





**SUPERIOR SERIES SD-15  
DIRECT CYLINDER MOUNTED  
AUTOMATIC SWITCHOVER  
GAS SULFONATOR**

**SPECIFICATIONS**

The Sulfonator shall be SUPERIOR™ MODEL SD-15 manufactured by Chemical Injection Technologies, Inc., Ft. Pierce, Florida, and shall have a maximum capacity of \_\_\_\_\_ pounds per day (gr/hr) of Sulphur Dioxide feed and shall be equipped with a Sulphur Dioxide flow meter of \_\_\_\_\_ pounds per day (gr/hr).

The Sulfonator shall be of modular design consisting of two (2) vacuum regulators, one (1) vacuum operated switchover module, one (1) flow meter/rate valve panel, and one (1) ejector/check valve. Each of these assemblies shall be capable of being individually located wherever safety and/or operator convenience dictates.

The vacuum regulators shall mount directly on the Sulphur Dioxide cylinder valves by means of a positive yoke type clamp having an integral tightening screw with slide bar handle. No wrenches or other tools shall be required to mount or dismount the vacuum regulator from the Sulphur Dioxide valve. The Sulphur Dioxide valve/Sulfonator inlet adaptor shall be constructed of corrosion-proof fluoroplastic material which shall be inert to the effects of wet, dry or liquid Sulphur Dioxide. The inlet safety shut-off/vacuum regulating valve shall be of capsulated design, easily removable as a unit from the outlet side of the yoke. A fluoroplastic filter shall be installed in the vacuum regulator inlet and shall be capable of removing impurities greater than 25 microns. A pressure relief valve shall be incorporated into the vacuum regulator to prevent pressure from building up in the system. All external screws and nuts shall be made of Titanium to prevent corrosion.

The switchover module shall be vacuum operated and shall be factory pre-set, not requiring field adjustment. The module shall automatically change Sulphur Dioxide feed from an empty Sulphur Dioxide cylinder to a full cylinder, with no manual resetting required after switchover has been made and the empty cylinder replaced.

The flow meter/rate control valve panel shall be capable of mounting wherever it is safest and most convenient for operating personnel. The panel shall be constructed of fiberglass reinforced thermoplastic material and shall incorporate a flow rate control valve made of fluoroplastic material which is inert to the corrosive effects of Sulphur Dioxide. The rate valve metering tip shall be constructed of fine, hard-drawn silver. Design shall provide for full closing of the rate valve without engaging the control surfaces, to prevent damage.

Vacuum shall be created by a fixed-throat venturi/ejector system connected directly to the Sulphur Dioxide solution diffuser. A dual high-pressure/low-pressure check valve system shall prevent water from entering the gas system. The ejector assembly shall be capable of withstanding water pressure up to 300 PSIG (20.7 Bars). A universal-type Sulphur Dioxide solution diffuser shall be provided which shall allow close-coupling of the ejector to a water main, use of flexible solution hose or rigid solution pipe without the use of special adaptors.

**STANDARD ACCESSORIES**

- 50 ft. - Vent & vacuum tubing
- 20 - Lead cylinder connection gaskets
- 1 - Cylinder Wrench
- 1 - Vent Insect Screen

**OPTIONAL ACCESSORIES AVAILABLE**

- |                        |                      |
|------------------------|----------------------|
| Inlet Water Assembly   | Gas Masks            |
| Wall manifold kits     | Gas Detectors        |
| Booster pumps          | Scales               |
| Residual Analyzers     | Gauges               |
| Automatic Controls     | Chlorine Comparators |
| Ton Container Adaptors | Others Available     |

**OTHER SUPERIOR™ SYSTEMS AVAILABLE**

- MULTIPLE-POINT GAS SULFONATORS
- 200 POUNDS PER DAY (5 KG/HR)
- 500 POUNDS PER DAY (10 KG/HR)
- GAS CHLORINATORS
- AMMONIATORS
- AUTOMATIC FLOW PROPORTIONING
- AUTOMATIC RESIDUAL CONTROL

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