

All-Vacuum System



Disinfection Products

Direct Cylinder Mounting

From the development in the early 1900's of a mechanical gas pressure feed device, to today's vacuum type solution feeder, no single improvement has changed the feeding method as much as the position of the vacuum regulator at a remote location on or at the gas source. The direct cylinder mounted gas feeder, with ejector at the point of application, developed by Capital Controls, promoted the concept of conveying gas under a safe vacuum condition from the gas source to the point of use. (Figure 1)

This feeding method offers the following distinct advantages:

SAFETY - In an all vacuum system, the location of the vacuum regulator on or at the source of the gas, reduces the gas to a safe, vacuum condition for conveyance from the gas source to the area of metering and rate control. From the metering and rate control area, the gas is conveyed under vacuum to the ejector, mixed with water and applied as a solution. The all-vacuum arrangement is available in capacities up to 10,000 pounds per day [PPD] (200 kilograms per hour [kg/h]).

SIMPLICITY - Pressurized gas and solution lines may be minimized or eliminated thereby simplifying the installation by the use of only vacuum piping. Certain mechanical devices, such as a gas pressure reducing valve, may also be eliminated with proper location of the vacuum regulator.

SERVICEABILITY - The availability of the components as modules with quick and simple disconnects, permit the vacuum regulator to be readily serviced in the field.

Remote Vacuum Regulator Arrangements

Remote vacuum regulation is available as a single regulator (Figure 2) or a pair of regulators arranged for automatic switchover. (Figure 3) Vacuum type automatic switchover is available up to 4000 PPD (80 kg/h).

A remote vacuum regulator provides a source of gas under vacuum for distribution to a remote metering and rate control system for single or multiple point application.

Solution metering panels for multiple point application can be eliminated by using remote vacuum regulation and multiple gas flowmeters (Figure 5), operated by one or more ejector. The hydraulic interplay associated with solution metering and distribution systems is eliminated.

Vacuum regulators for gas vacuum service are available in the following maximum capacities.

Chlorine	Sulfur Dioxide	Ammonia
500 PPD (10 kg/h)	500 PPD (9.5 kg/h)	250 PPD (5 kg/h)
2000 PPD (40 kg/h)	2,000 PPD (38 kg/h)	1,000 PPD (20 kg/h)
8,000 PPD (150 kg/h)	8,000 PPD (152 kg/h)	4,000 PPD (80 kg/h)
10,000 PPD (200 kg/h)	10,000 PPD (190 kg/h)	5000 PPD (100 kg/h)

Figure 4 shows a typical installation providing remote vacuum regulation at the gas supply. Suitably sized from the storage room through the wall, into the metering and rate control room. Remote vacuum regulators can distribute gas to all control methods. Refer to Bulletin 010.3115.

Economy

By confining the gas under pressure to a single storage area, only one gas detector is required. Alternate systems conveying gas under pressure from a storage room to a metering and rate control room require the use of two gas detectors. Gas vacuum piping is lower in cost and installation than gas pressure or pressurized solution piping.

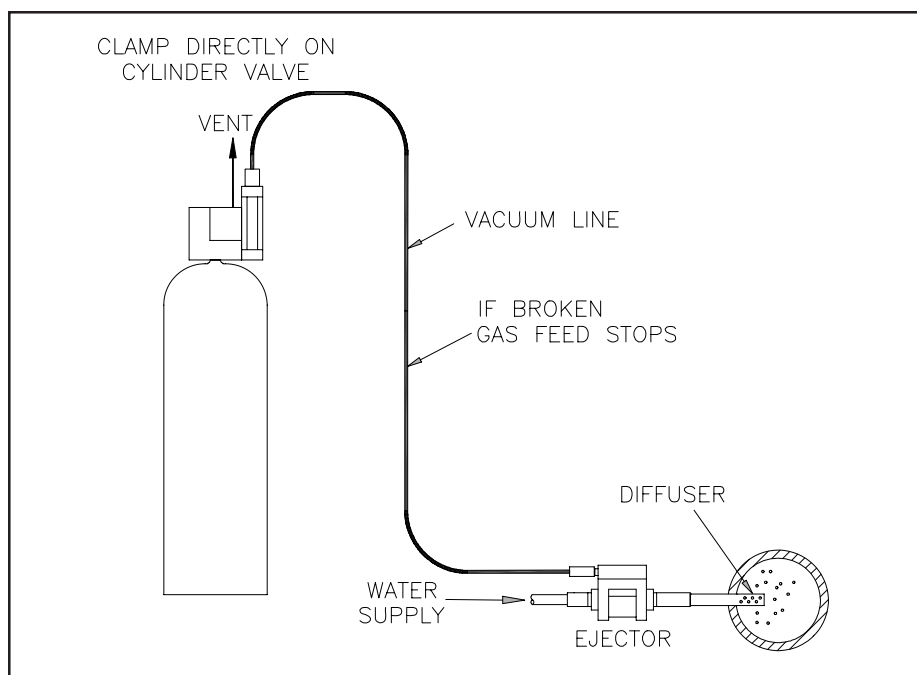


Figure 1 - All-Vacuum System

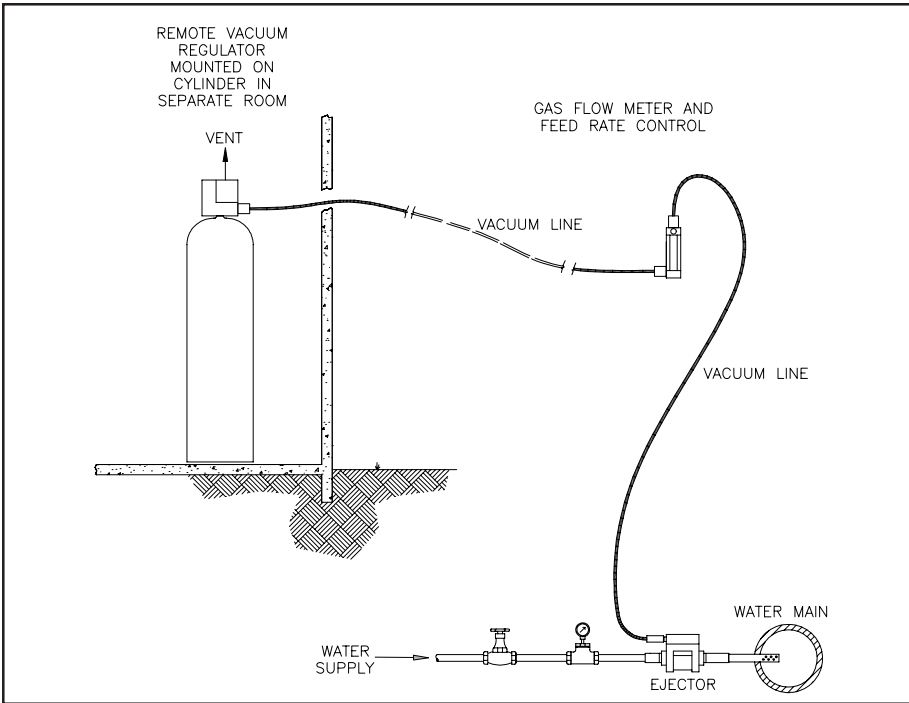


Figure 2 - Remote Vacuum Regulator and Flowmeter With Pipeline Installed Ejector

The combination of the remote vacuum regulator with multiple metering tubes and ejectors eliminates solution metering and distribution which is extremely difficult to operate.

Remote vacuum regulation is ideally suited to vacuum type automatic switchover. A pair of vacuum regulators are provided with an automatic switchover device. The vacuum regulator in service depletes its gas supply and the module automatically over to the standby vacuum regulator, feeding gas from a separate independent supply. (Figure 6)

The primary advantage of the all-vacuum system is the ability to locate the three major components where best suited for the application, operator convenience and system safety.

All-vacuum systems are available for chlorine, sulfur dioxide, ammonia, and other gases.

Single, high capacity vacuum regulators can serve any number of metering and rate control units provided the combined rate does not exceed the capacity of the vacuum regulator. For example, a single 10,000 PPD (200 kg/h) vacuum regulator can provide a source of gas under vacuum to five 2,000 PPD (40 kg/h) metering and rate control units. Each metering and rate control system operates independently without affecting the other systems.

Summary

Remote vacuum regulation is available throughout the complete vacuum type feeder product line.

Loss of vacuum on the inlet side of the main regulating diaphragm of the vacuum regulator causes the inlet valve to close, stopping the flow of gas. An operating ejector will evacuate the gas from the vacuum line (followed by air) downstream of the vacuum line break. Breakage of The vacuum line is far safer than breakage of the gas pressure line or solution line.

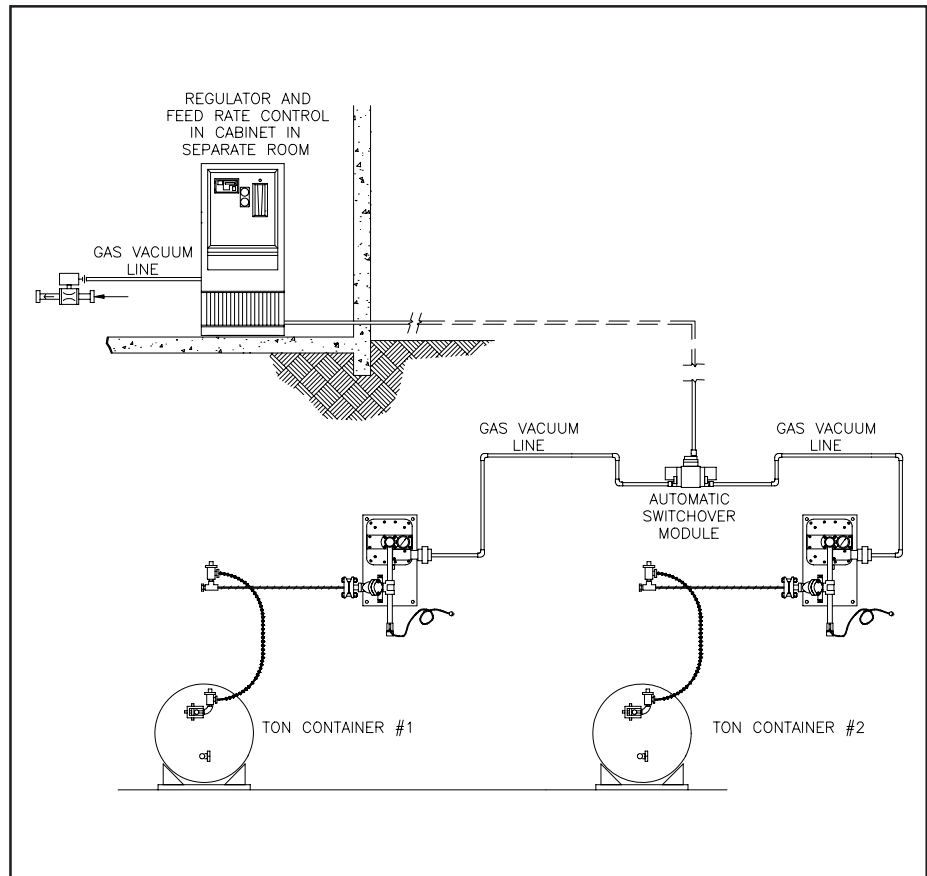


Figure 3 - High Capacity Automatic Switchover System

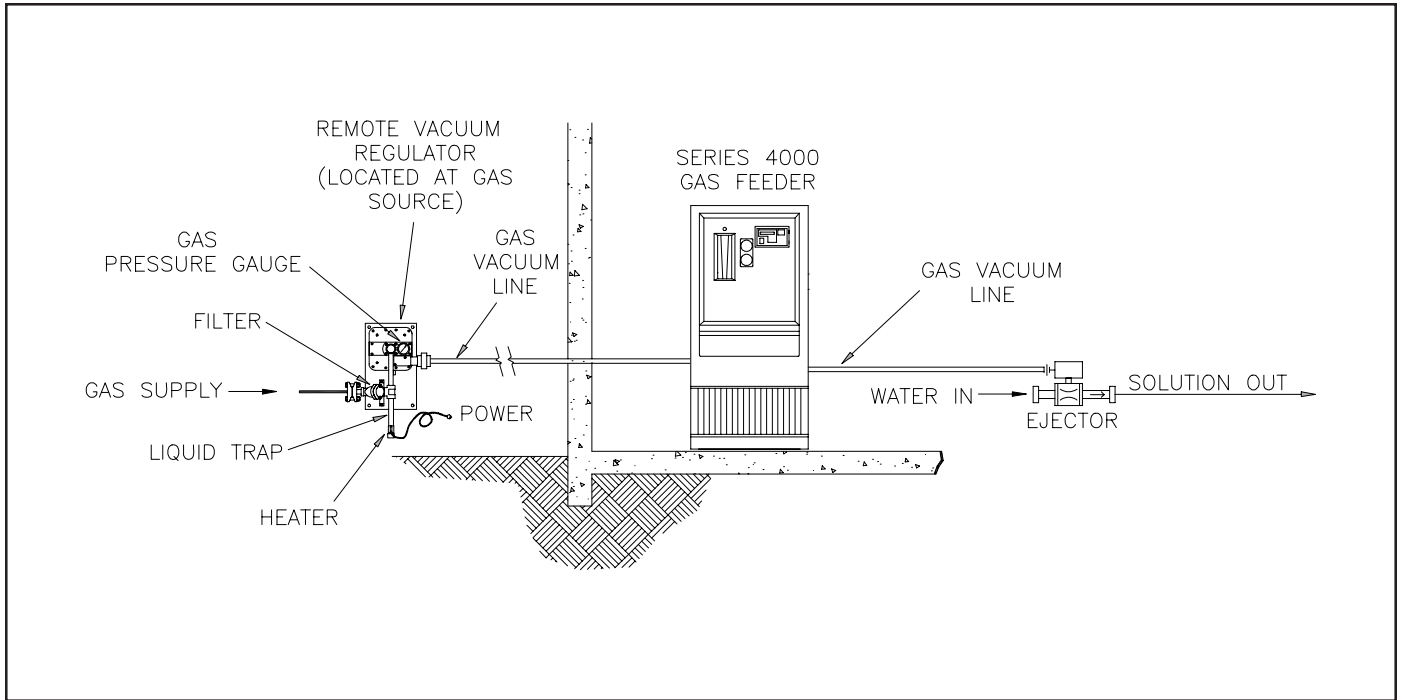


Figure 4 - High Capacity System With Remote Vacuum Regulator

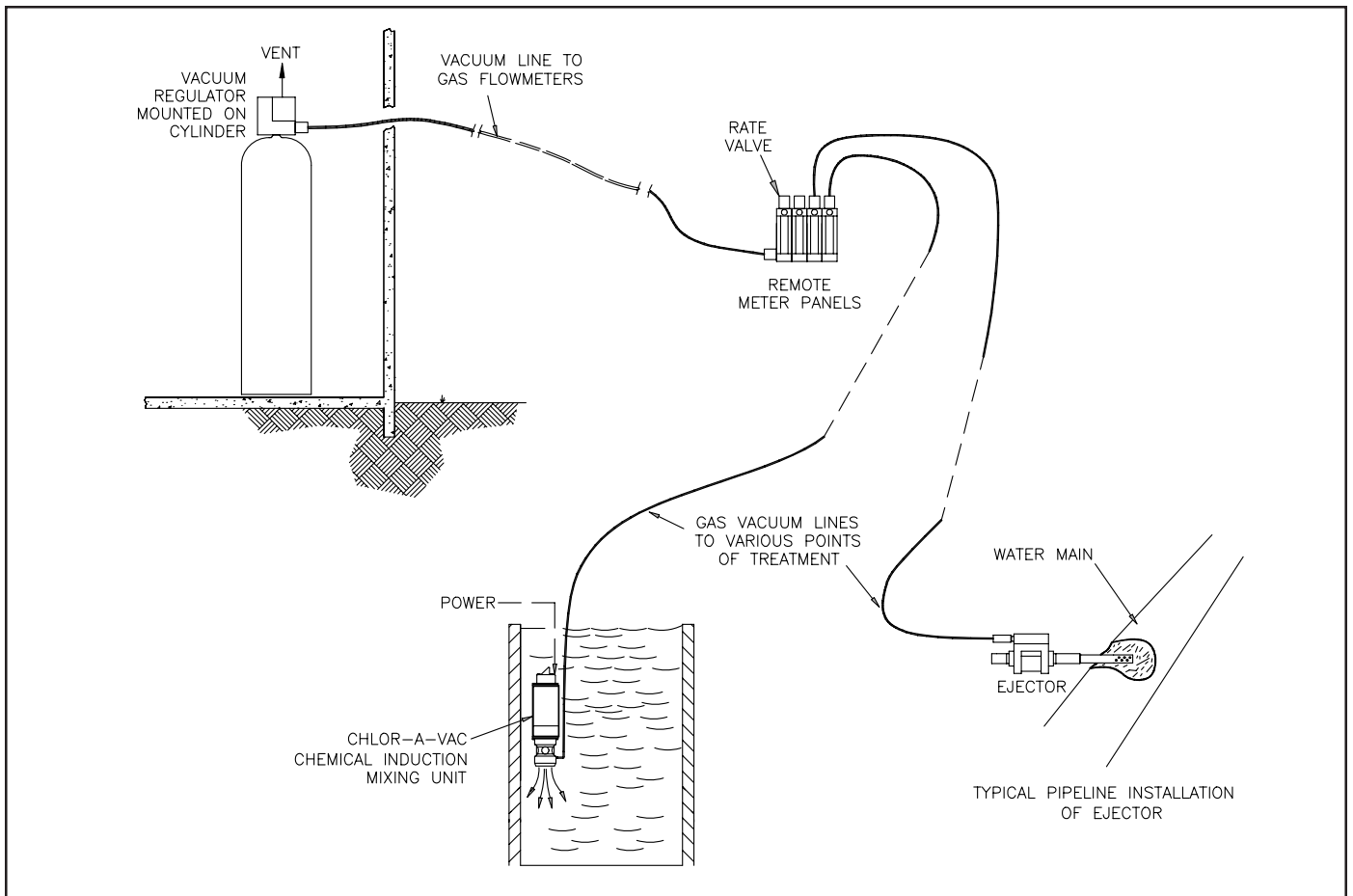


Figure 5 - Multiple Gas Metering

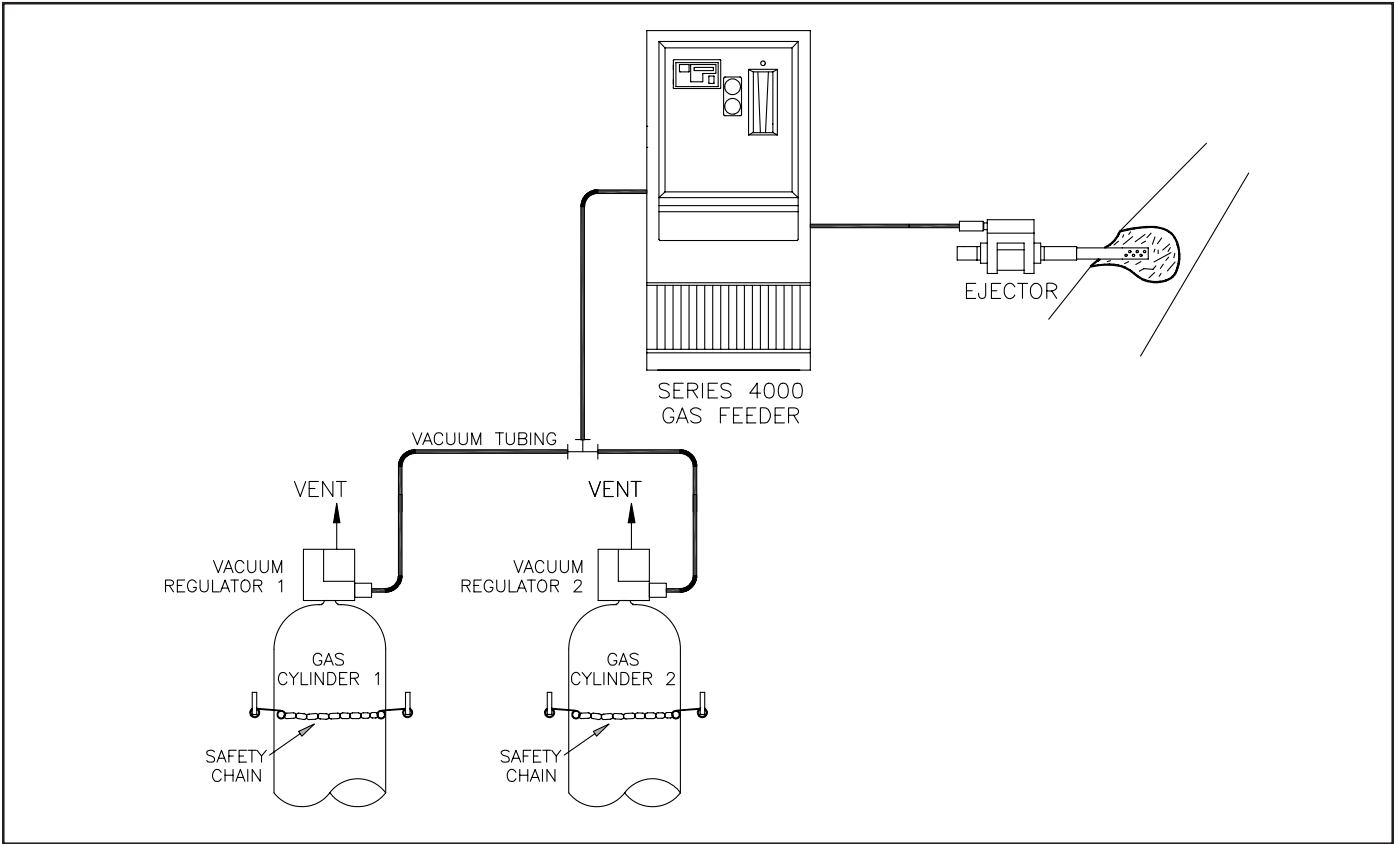


Figure 6 - Low Capacity Automatic Switchover System

Design improvements may be made without notice.

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