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# APPLICATION / INSTALLATION DATA SHEET

## OPERATION OF REGAL EJECTOR WITHOUT A BOOSTER PUMP

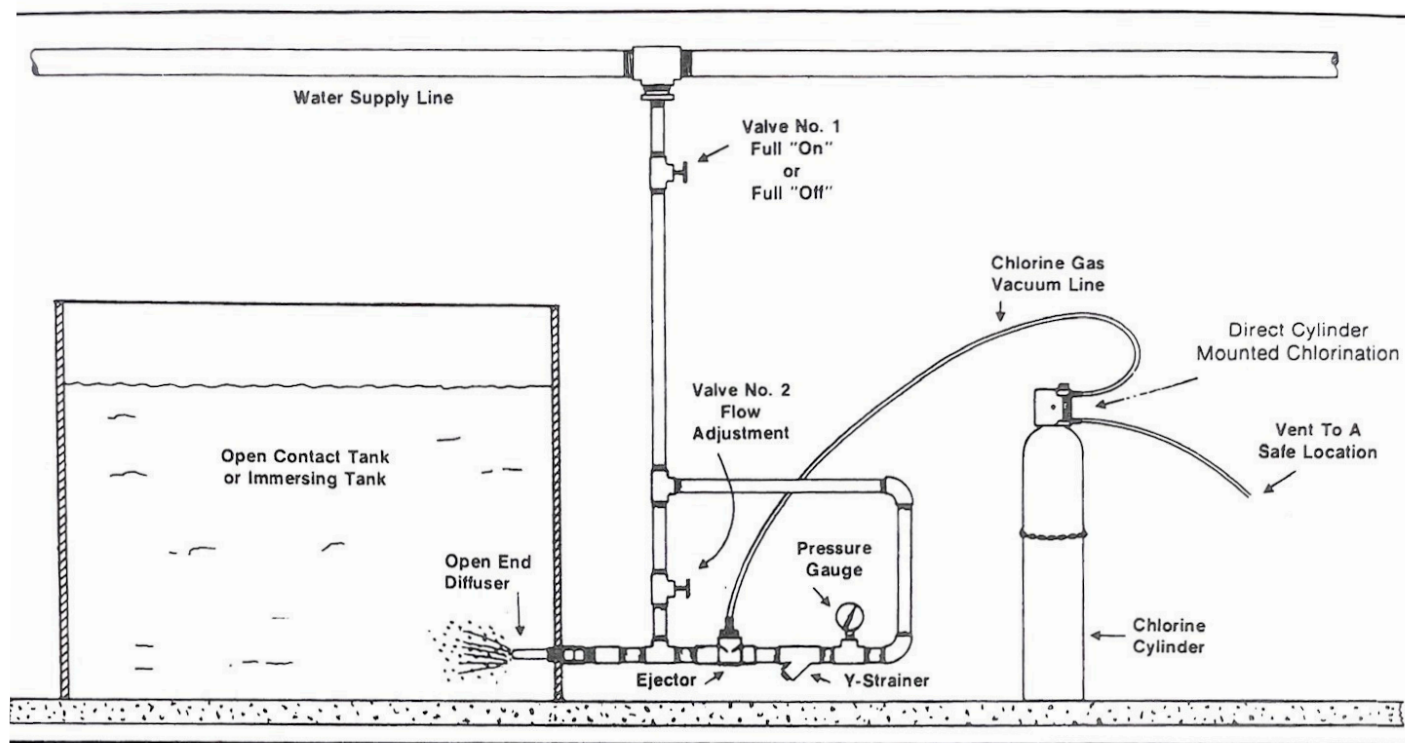


Fig. 1-Using Water Line Pressure To Operate The Ejector

### OF SPECIAL INTEREST FOR:

- Wastewater Treatment Plants
- Water Treatment Plants
- Food Processing Plants
- Industrial Plants
- Other Similar Operations

This information is provided as a general guide only. For your personal safety, observe all equipment instructions carefully and thoroughly. Installations must be made in accordance with applicable codes and regulations.

In most gas chlorinator installations where the ejector will be working against a high backpressure (above 20psig), it is generally necessary to install a booster pump to consistently produce the vacuum necessary to operate the ejector and the chlorinator. However, in low backpressure applications, it is possible to utilize other methods to create the pressure differential across the ejector necessary to produce the system's operating vacuum. This, of course, saves the initial cost of the booster pump, the installation costs and subsequent maintenance costs.

These alternative methods are frequently used as part of an overall chlorination system to increase the chlorine residual at secondary treatment points but can also be used at the primary point of chlorination. For example, in food processing plants the water would be initially chlorinated using a booster pump but further along in the processing operation, where there are water usage points that require higher chlorine residuals, additional chlorination application points using one of these methods could be installed if the application involves a low backpressure.

### METHOD NO. 1 - USING WATER LINE PRESSURE

A typical example of this method involves an open tank or immersion tank or a similar type of application. A water supply line for the chlorinator's ejector is tapped off from the tank's water fill pipe as shown in Fig. 1. Valve No. 1 is an on/off valve. It can be either a quick-open manual valve, or an electrically operated solenoid valve. It is either fully open or fully closed allowing either full water flow or no water flow. Valve No. 2 is a throttling valve and is adjusted to divert a portion of the water through the ejector when Valve No. 1 is opened fully. Valve No. 2 is adjusted so that the desired chlorine feed rate can be maintained, and then the valve handle is removed to prevent accidental re-adjustment.

When Valve No. 1 is opened, water flows into the tank and through the ejector, at a constant chlorine dosage level.

### METHOD NO. 2 - USING A PRESSURE REDUCING VALVE

This method relies upon a main supply pressure that does not experience severe drops. A typical installation is shown in Fig. 2.

The ejector is being supplied by the higher water pressure in the main water supply line and is injecting the chlorine solution back into the lower system pressure on the low pressure side of the pressure reducing valve. The valve must create the pressure differential necessary for the ejector operation, and total water flow rate through the system must be adequate.

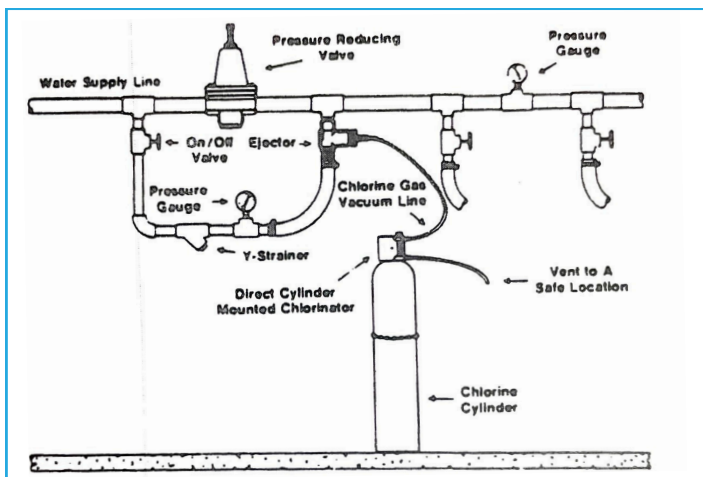


Fig. 2 - Using A Pressure -Reducing Valve To Operate The Ejector

## INSTALLATION NOTES

1. Total water flow rates should be carefully calculated. When installed in existing water systems, both methods will result in a decreased total system water flow, unless supply line water pressure is increased and/or pipe friction losses are decreased.
2. If water pressures vary (although they must be greater than the minimum ejector requirements), then the total water flow rate through the system will vary. Since the chlorine feed rate is a constant, the resulting chlorine dosage rate will vary accordingly.

## DOSAGE

The dosage will depend primarily upon the application but factors such as the quality of the water, ph, water temperature, etc. also play a role.

Whenever any two of the variables shown in Table A are known, the third variable can be determined easily - gallons per minute (gpm)/liters per second (l/sec): pounds per day (ppd) grams or kilograms per hour (g/hr or kg/hr): parts per million (ppm)/milligrams per liter (mg/l).

**TABLE A - Determining ppm (mg/l)**  
**For Some Specific Chlorine Feed Rates & Water Flow**

| gpm (l/s)   | ppd (g/hr) |            |            |            |            |            |
|-------------|------------|------------|------------|------------|------------|------------|
|             | 3 (56.7)   | 7 (132.3)  | 20 (378)   | 35 (661.5) | 50 (945)   | 75 (1418)  |
|             | ppm (mg/l) | ppm (mg/l) | ppm (mg/l) | ppm (mg/l) | ppm (mg/l) | ppm (mg/l) |
| 25 (1.58)   | 10.0       | 23.3       | 66.7       | 116.7      | 166.7      | 250        |
| 50 (3.15)   | 5.0        | 11.7       | 33.3       | 58.3       | 83.3       | 125        |
| 100 (6.31)  | 2.5        | 5.8        | 16.7       | 29.2       | 41.7       | 62.5       |
| 150 (9.46)  | 1.67       | 3.9        | 11.1       | 19.5       | 27.8       | 41.8       |
| 200 (12.62) | 1.25       | 2.9        | 8.3        | 14.6       | 20.8       | 31.8       |
| 250 (14.19) | 1.0        | 2.3        | 6.7        | 11.7       | 16.7       | 25.0       |
| 300 (18.9)  | 0.83       | 1.9        | 5.5        | 9.7        | 13.8       | 20.8       |
| 350 (22.08) | 0.71       | 1.7        | 4.7        | 8.3        | 11.8       | 17.8       |
| 400 (25.23) | 0.625      | 1.5        | 4.2        | 7.3        | 10.5       | 15.8       |

$$\text{ppm} = \frac{\text{ppd}}{0.0121 \times \text{gpm}}$$

$$\text{mg/l} = \frac{\text{g/hr}}{3.6 \times \text{l/sec}}$$

ppm = parts per million  
ppd = pounds per day  
gpm = gallons per minute

mg/l = parts per million  
g/hr = pounds per day  
kg/hr = gallons per minute  
l/sec = liters per second

For example, a chlorine feed rate of 20 ppd (378 g /hr) being fed into a water line with a water flow of 100 gpm (6.31/sec) the resultant chlorine dosage rate is 16.7 ppm (mg/l)