REGAL GAS CHLORINATOR

APPLICATION / INSTALLATION DATA SHEET

WELL WATER CHLORINATION USING A BOOSTER PUMP

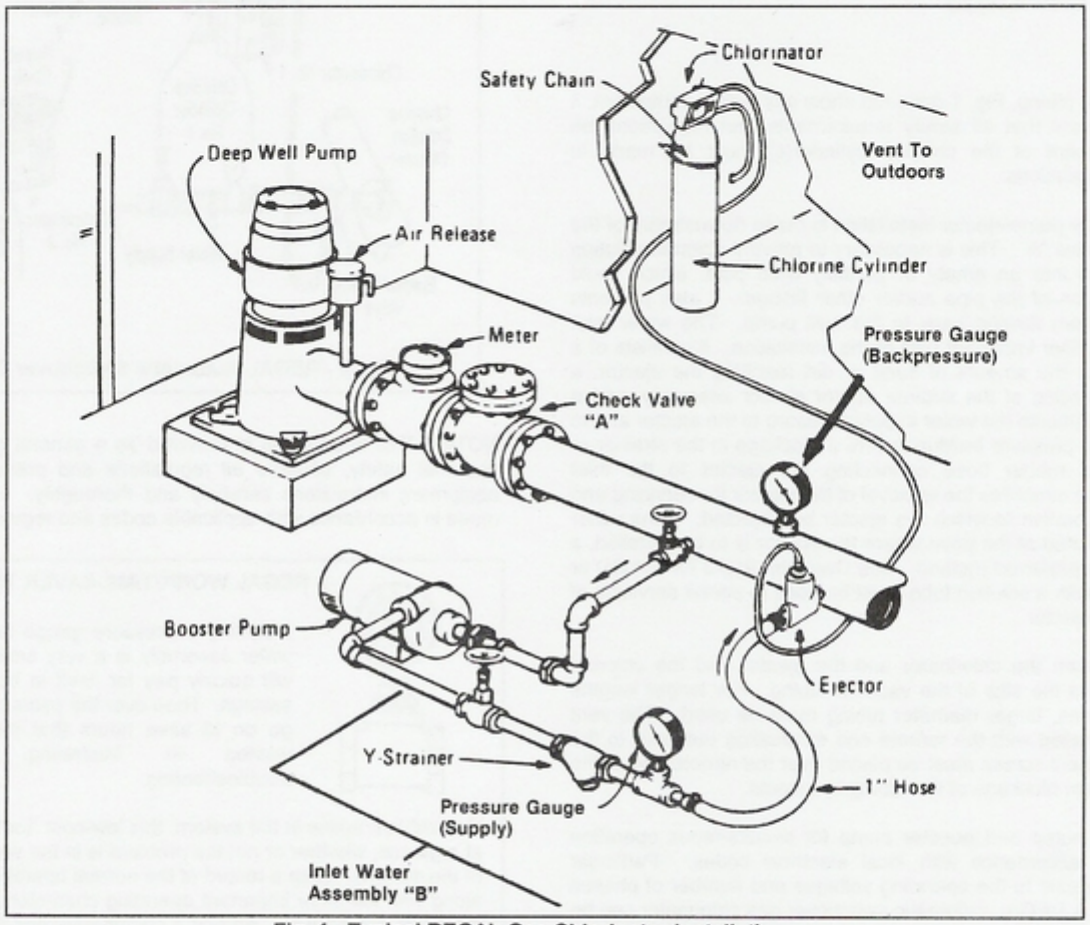

Fig. 1 - Typical REGAL Gas Chlorinator Installation.

GENERAL

One of the most common methods of obtaining a potable water supply is by drilling a deep well. Water obtained from a well source is known as "ground water", as opposed to "surface water." Sometimes ground water is the only available, reliable supply when lakes or rivers are too far distant. With so much of the available surface water being polluted by contaminants from so many different sources, drilling a well is often the only relatively safe and economical alternative, other than rainwater, that remains open to many people. Because of the natural filtration that well water undergoes below the ground, it is relatively free of organic matter, bacteria and other contaminating materials that would otherwise require more extensive and more costly treatment before it is used to determine exactly what treatment is required. To ensure that well water is safe for consumption, most public wells disinfect the water that they supply and the most preferred method of treatment is chlorination.

The most economical and widely accepted method of disinfecting water is gas chlorination. The chlorine gas is mixed with water and this chlorine solution is injected into the main flow of well water. To avoid having a chlorine solution go through the expensive well pump, which could cause corrosion in the pump, the solution is generally injected into the pressurized water main after the well pump.

On/off operation of a well pump is generally controlled automatically by means of a pressure switch in a hydropneumatic tank or a water level switch in an elevated storage tank. Most well pumps are designed to operate at a constant speed, which means that when they are operating, all other things remaining constant, they are delivering a constant water flow rate. Because of this constant water flow, the on/off operation of vacuum-operated gas chlorination, adjusted to feed the required amount of chlorine gas, can be synchronized with the on/off operation of the well pump. When the pump is "on", the chlorinator will feed the preset amount of chlorine gas. When the well pump turns "off", the chlorinator stops feeding gas. To accomplish this, a booster pump is wired to the secondary contacts of the well pump so both pumps will turn on and off at the same time. The booster pump supplies the water flow and pressure that are required to operate the ejector, which generates the vacuum necessary to operate the chlorinator. Selection of the booster pump size is based upon the pressure and water flow rate required to produce the vacuum necessary to operate the gas chlorinator and the pressure necessary to inject the chlorine solution into the pressurized water main.

A typical direct-cylinder-mounted gas chlorinator/booster pump installation is shown in Fig. 1. For purposes of simplicity, some piping and components that would normally be used with the high head well pump illustrated are not shown. Check local codes and regulations. The primary purpose of the illustration is to show the various components of the gas chlorination system and their relative arrangement.

SYSTEM OPERATION

When water is called for, the well pump is turned on. Simultaneously, the chlorinator booster pump is turned on. This forces water through the vacuum-producing nozzle (venturi) in the ejector assembly, creating a vacuum. The vacuum is transmitted through the tubing connecting the ejector and the chlorinator, and causes the safety inlet valve in the chlorinator to open allowing chlorine gas to be drawn from the cylinder by the vacuum. The gas flows through the vacuum tubing to the ejector where it is mixed with the water flowing through the nozzle and the resultant chlorine solution is injected into the water main. When the well pump is turned off, the booster pump is also turned off, which stops the vacuum-producing action of the ejector and safely shuts down the chlorinator and the chlorine supply.

INSTALLATION

As with some of the piping, Fig. 1 does not show any safety equipment, it is extremely important that all safety requirements and regulations be observed. Placement of the chlorine cylinder(s) must be made in accordance with regulations.

Note that the booster pump/ejector installation is made downstream of the well pump check valve "A". This is necessary to prevent chlorine solution from being injected into an empty or partially filled pipe, which could cause rapid corrosion of the pipe and/or other fittings. It also prevents chlorinated water from flowing back to the well pump. The water inlet assembly "B" is another important part of the installation. It consists of a strainer to minimize the amount of sand or dirt reaching the ejector, a valve to permit servicing of the strainer and/or ejector assembly, and a pressure gauge to indicate the water supply pressure to the ejector and to indicate if there is a pressure buildup due to a blockage in the strainer or ejector. Note the rubber hose connecting the ejector to the inlet assembly. The hose simplifies the removal of the ejector for servicing and also reduces the vibration to which the ejector is subjected. If the water main cannot be isolated at the point where the ejector is to be installed, a PVC ball valve (the preferred method. See Dwg. No. 915-3 for details) or a corporation stop with a solution tube must be used to permit servicing of the strainer and/or ejector.

The distance between the chlorinator and the ejector and the chlorine feed rate determines the size of the vacuum tubing. For longer lengths and higher feed rates, larger diameter tubing must be used. The vent tubing must be installed with the remote end exhausting outdoors to the atmosphere. An insect screen must be placed over the remote end of the vent tubing to prevent blockage of the tubing by insects.

Wiring of the well pump and booster pump for simultaneous operation must be done in accordance with local electrical codes. Particular attention should be paid to the operating voltages and number of phases of the two pumps. A REGAL automatic-switchover gas chlorinator can be used. In this case, this system uses gas cylinders, one of which operates as the supply cylinder until it empties out, at which point the gas chlorinator automatically switches over to the second, reserve cylinder. This system assures a continuous chlorine supply without any special action on the part of the operator other than to change the empty cylinder. See Fig. 2.

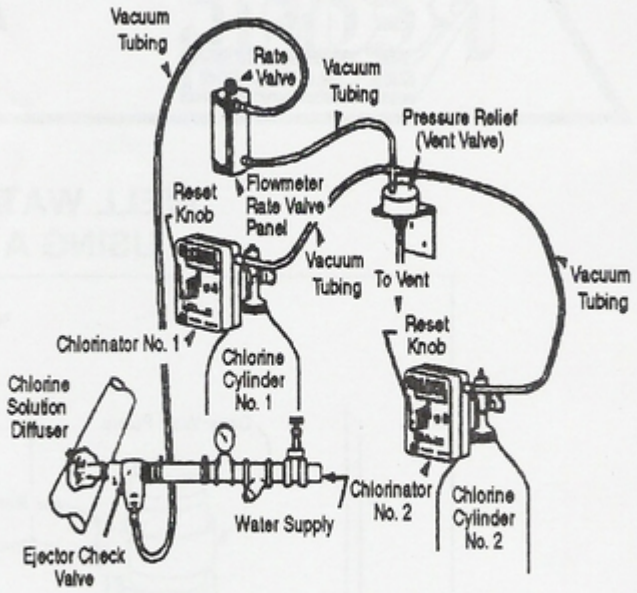

Fig. 2 - REGAL Automatic Switchover Chlorinator

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

A REGAL WORK/TIME-SAVER TIP

Including a pressure gauge as part of the inlet water assembly is a very small investment that will quickly pay for itself in both work and time savings. Then over the years of operation, it can go on to save hours that might otherwise be wasted in frustrating, time-consuming troubleshooting.

If a problem arises in the system, this low-cost "tool" quickly tells you, at a glance, whether or not the problem is in the water supply section of the system. Keep a record of the normal operating pressure range along with the other important operating characteristics of the system for future comparison. Should a chlorine-feeding problem arise, any change in the pressure gauge reading, up or down, means that you should concentrate your troubleshooting efforts on the water supply portion of the system. An unchanged pressure reading indicates that you should look elsewhere for the problem.

Experience shows that omitting this inexpensive pressure gauge is a false economy.

Distributed by:

chlorinators incorporated

1044 S.E. Dixie Cutoff Road
Stuart, Florida 34994 U.S.A.
Phone: (772) 288-4854 • FAX: (772) 287-3238
www.regalchlorinators.com • E-mail: chlorinc@aol.com

 Printed in U.S.A.

Pub. No. 205-7