

SAFE

RELIABLE

ECONOMICAL



**REGAL™**

**GAS CHLORINATORS • SULPHONATORS • AMMONIATORS**

# SAFE

Safety starts right at the cylinder valve, with the REGAL heavy-duty vise-type mounting yoke.

## Safety is designed and built into the REGAL.

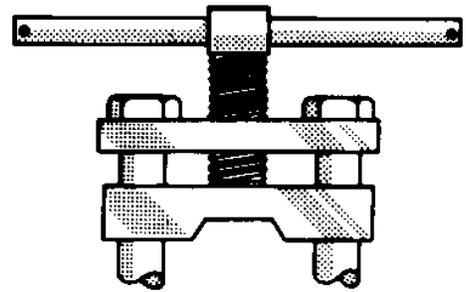
The fact that the REGAL mounts directly on the cylinder is in itself a major safety factor. But added to that is the design and structure of the REGAL mounting yoke.

It is built with the heaviest slide bars and tightening bolt in the industry, to ensure proper alignment and sealing of the lead gasket inlet connection.

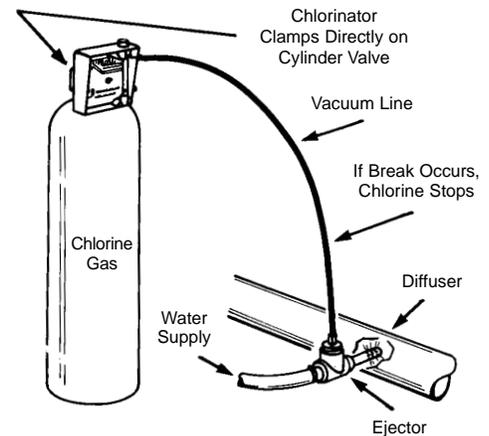
A built-in tightening handle provides just enough leverage to tighten the yoke and seal the gasket. It will itself bend before allowing you to exert enough pressure to bend the yoke, possibly causing misalignment of the chlorinator's inlet adapter and the cylinder's valve, or squeezing the gasket out of the connection. Both of these can cause gas leaks, and both could happen with competitive units that require a separate wrench.

An advanced, high strength fluoropolymer coating, bonded to the yoke by an electrofusion process, gives the REGAL yoke extremely high resistance to corrosion from either chlorine or sulfur dioxide. It will not chip and allow corrosion to undermine it, as epoxy coatings can.

And while the coating can be scratched — although not easily — only the metal exposed by the scratch can corrode. The coating keeps the corrosion from spreading.



### REGAL ALL-VACUUM GAS CHLORINATION SYSTEM



*ON THE COVER*  
Series 200:  
Mount Directly  
To 150 Lb. Cylinders  
and Ton Containers,  
with Feed Rates up  
to 500 lbs/24 hrs.

Series 2000:  
High Capacity,  
with Feed Rates up  
to 2000 lbs/24 hrs.

## REGAL safety extends through-out the entire all-vacuum system.

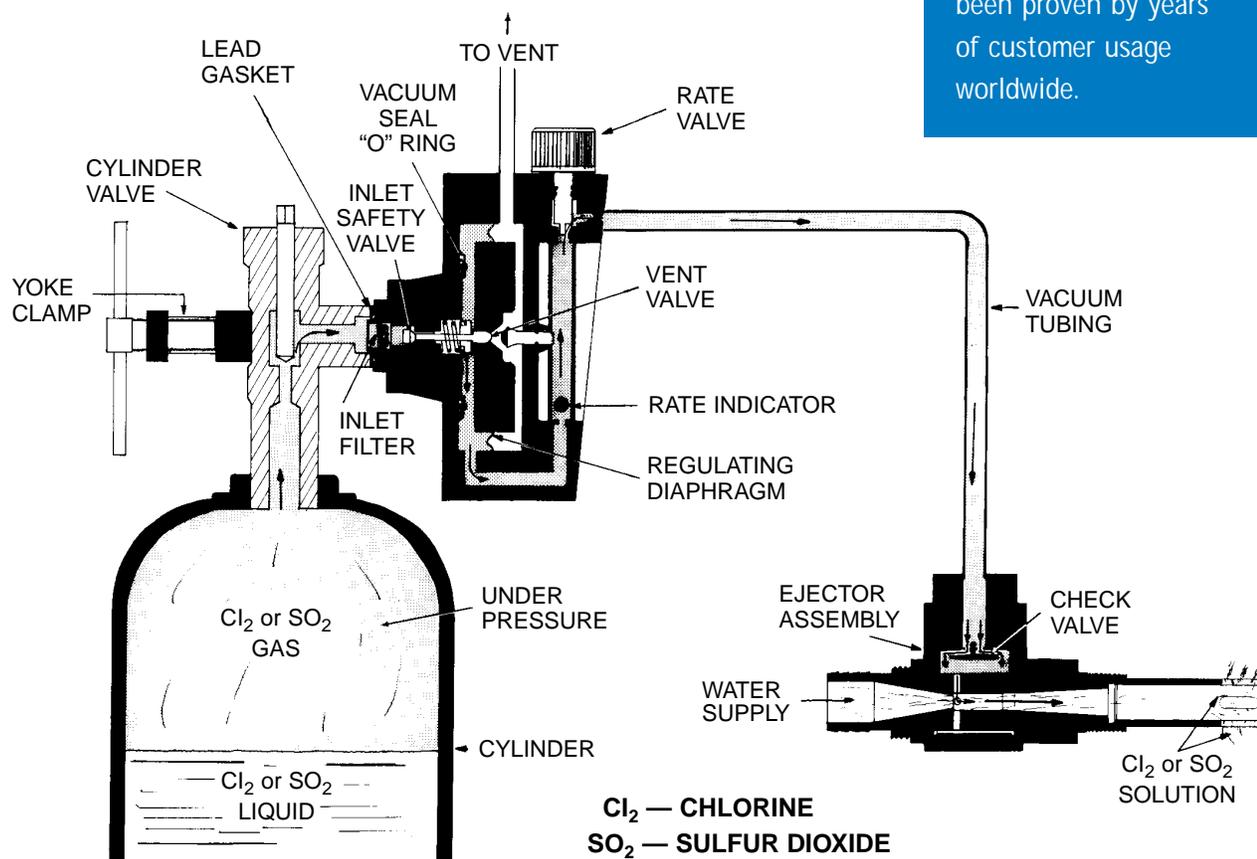
Chlorine is never under pressure in the REGAL system. A vacuum — created by water being forced under pressure through the ejector nozzle — pulls on an extremely tough and resilient diaphragm which pushes open a springloaded inlet/safety-shut-off valve. The vacuum draws the gas from the cylinder, through the chlorinator, then through high-strength vacuum tubing, into the ejector. There it mixes with the water that's rushing through the ejector, and is carried to the diffuser which passes it into the water being treated.

Every surface the gas touches, from the time it leaves the cylinder until it enters the water, consists of the most advanced, corrosion resisting materials available. And there are no supply pressure lines, valves, or fittings to break or corrode.

But most important: should anything happen to cause a break in any part of the system, gas does not leak out. Air leaks in, and the vacuum is lost. With no vacuum to pull it open, the powerful spring on the inlet/safety shut-off valve snaps the valve shut, stopping the gas supply immediately and automatically.

An adjustable feed rate valve and feed rate indicator are built into the REGAL, to allow the flow of gas to be manually adjusted and observed.

The ALL VACUUM REGAL SYSTEMS virtually eliminate the problems associated with Old Pressure Type Manifold Systems. The safety and reliability of REGAL systems has been proven by years of customer usage worldwide.



# RELIABLE

## Reliability is also designed and built into the REGAL.

It starts with a simple, efficient design that uses only 68 parts... and progresses through careful hand assembly, inspection and testing by skilled technicians.

Simplicity is one key to reliability — and the REGAL design is simpler, more efficient than any other comparable unit. It has only 68 parts — up to 60% fewer than competitive units. The design is, in fact, so simple and logical that very little time is needed for anyone to learn how to service it, and only a screwdriver and pliers are needed for servicing.

Another key to reliability is corrosion resistance, and every one of the REGAL's 68 parts is made of materials best suited to handle the gas form of  $Cl_2$ ,  $SO_2$ , or  $NH_3$ . In fact, these materials are also the best selection to help **withstand** attack by the liquid form of these chemicals.\*

*\* These feeders are designed for gas use only. The liquid form of these chemicals **WILL** cause damage to system components. Therefore, if liquid chemical does enter the system components, contact the factory immediately.*

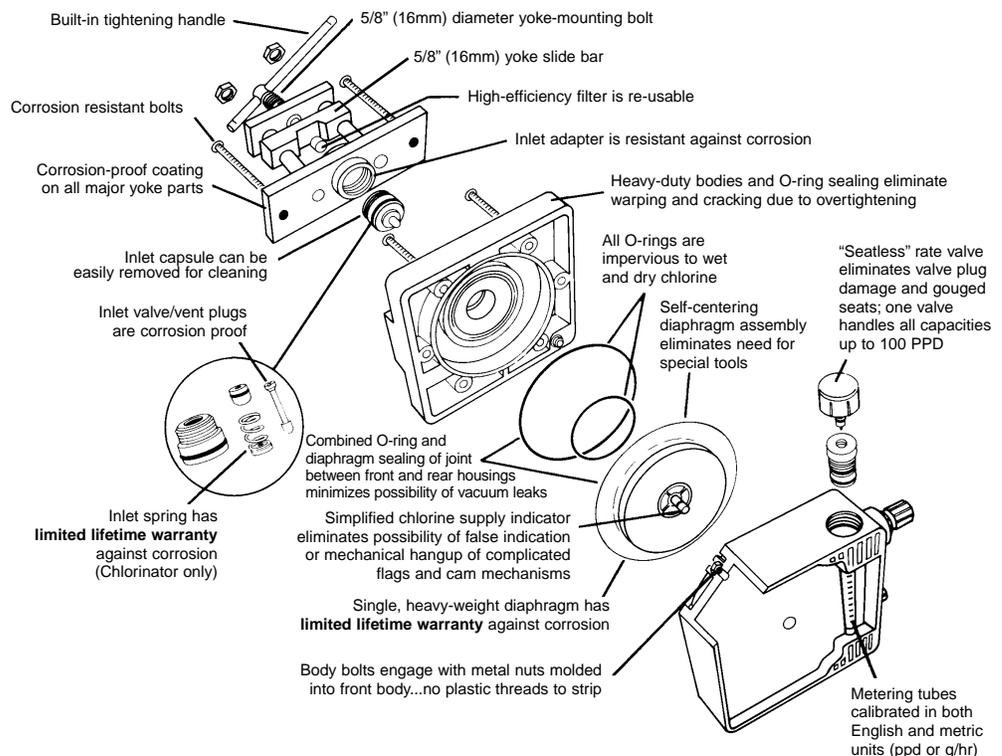
Every REGAL is completely hand-assembled. And the highly skilled technician who assembles it is also responsible for seeing to it that it is in perfect condition before it leaves his or her hands. That involves careful visual inspection at every step of the process, and bench testing of the completed unit.

When the assembling technician is completely satisfied with the unit, it is sent to the REGAL testing room. There it receives a series of stringent test to a) make sure it has no gas leaks, b) check its vacuum integrity, and c) measure its operating performance. All these tests are performed against high-efficiency performance curves, unless the customer has supplied us with data that enable us to test the system against actual operating conditions in the intended application.

## THE REGAL INSIDE STORY

REGAL Gas Chlorinators/ Gas Sulphonators are so foolproof and easy to maintain!

- Efficient, simple design
- Only 68 parts
- Quality materials that stand up to wet and dry chlorine attack
- Only screwdriver and pliers needed for servicing
- Capacities up to 500 lbs/day (10 kg/hr)



## The REGAL ejector is another factor in the system's reliability. And in its economy, too.

The ejector may very well be the most important component in a vacuum-operated, solution-feed gas chlorinator system, because it performs three of the system's most vital functions:

- It creates the vacuum that pulls the gas from the cylinder. Without the vacuum, the system simply will not operate, and if the ejector isn't functioning properly, there is no vacuum.
- It mixes the chlorine, sulfur dioxide, or ammonia with the water.
- It keeps water from entering the system.

The design and construction of the REGAL ejector make it virtually immune to failure — hence unique in the industry. Other ejectors are the cause of 50% of all service problems.

The REGAL ejector consists of four components, all of them made of very strong, special plastic, which will not crack, and which enables it to withstand back-pressure rating of 200 psig. It can be taken apart for cleaning — and put back together — in minutes, with no special tools.

Our nozzle has been designed to produce the highest vacuum at lowest pressures and water flow rates, so that if you need a booster pump you can use the economical centrifugal type. And because we know that our single-piece nozzle will never be misaligned and that its operating characteristics will therefore never change, we can pre-test every one against an optimum performance curve.

When the system is shut off, pressure from water flowing through the nozzle could force water up the same tube through which chlorine enters when the system is operating — if the ejector did not incorporate a one-way check valve.

As explained on Page 6, REGAL offers two distinctly different check valves — one for high back pressures, one for low. Both — like everything else in the REGAL system — are designed and built for the highest reliability, highest performance, and lowest maintenance.



### HOW THE EJECTOR PRODUCES A VACUUM

Vacuum is created by water under pressure flowing through a very efficient constant differential venturi in the nozzle. At the venturi, there is a pressure drop as the molecules of water pass at a high rate of speed through the restricted venturi and immediately step back out to a larger unrestricted area. This always forms a vacuum as long as the inlet supply pressure is high enough to overcome the total system backpressure.

# ECONOMICAL

It needs very little servicing, and is easy to take apart for cleaning.

What's true of the system as a whole, is true of every one of its parts.

**REGAL is the most economical for the same reasons it's the most reliable.**

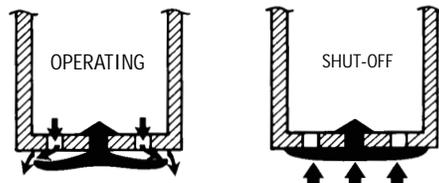
## WHY TWO CHECK VALVES? BECAUSE COMPROMISES DON'T WORK.

High and low back pressures require entirely different kinds of check valves. REGAL gives you both.

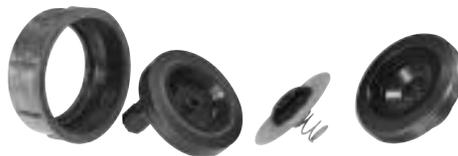
For high pressures, REGAL offers a single piece check valve that utilizes pressure to close it.

Where back pressure isn't strong enough to close the check valve we've designed a check valve with a closing spring strong enough to give a bubble-tight seal, and a diaphragm with large enough surface area to eliminate any friction loss or pressure drop across the check valve.

Both check valves are made of materials totally resistant to chemical attack by both wet and dry chlorine, sulfur dioxide, or ammonia.



One-Piece Ejector Valve Stops High-Pressure Wear Problems



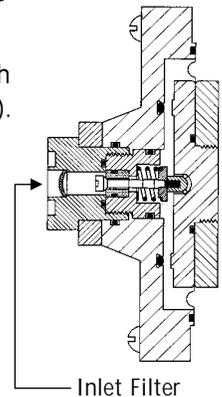
Single-Purpose Low-Pressure Valve Assures Tight Low-Pressure Seal

## OPTIONAL DUAL CHECK VALVE EJECTOR TO 500 PPD

The REGAL A-950 Dual Check Valve Ejector has a ball check valve as the primary check valve backed up by a spring loaded O-ring/poppet check valve.

## REGAL FILTER CATCHES FINER PARTICLES, SAVES MONEY, TOO.

REGAL uses an innovative corrosion resistant (dual thickness) plastic filter that is suitable for chlorine or sulfur dioxide systems. The filter has extremely low pressure drop characteristics for better sonic flow control and permits flow rates as high as 2000lbs/day (40 kg/hr). It saves money because it can be cleaned and reused indefinitely; and removing it for cleaning is quick and easy.

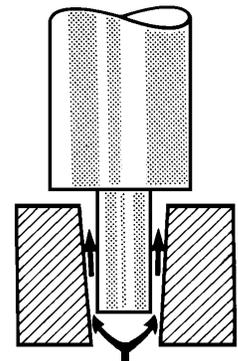


## RATE VALVE WITH TAPERED OPENING ELIMINATES VALVE SEAT, FOR MORE ACCURATE SETTINGS — AND LONGER LIFE.

The "seat" used in most rate valves is subject to wear, and is frequently damaged, particularly at low feed rates.

By eliminating the seat, and relying instead on a tapered opening to control the flow, we have not only greatly extended the life of the rate valve, but also increased its accuracy. Rates can be set as easily and accurately at the bottom end of the metering tube as at the top, and the maximum feed rate can be changed by merely changing the flow metering tube.

The same rate valve is used for all standard rates up to 100 lbs/day (2 kg/hr).



"Seatless" Rate Valve

The diaphragm and the inlet/safety shut-off spring are the two chlorinator parts most vulnerable to corrosion and in the REGAL are corrosion-proof.

**CORROSION-RESISTANT,  
METALLIC INLET ADAPTER**



The inlet adapter is the last point at which the gas is still under pressure and therefore, must be made of a material strong enough to handle the pressurized gas without being compromised. The REGAL inlet adapter is made from a special metal alloy that is virtually impervious to attack by dry, wet, or even liquid chlorine and sulfur dioxide under normal circumstances and operating conditions.

**CORROSION-PROOF,  
SUPER-STRONG DIAPHRAGM**



It is the diaphragm which opens the inlet safety valve to allow the gas to flow, and which maintains a steady flow of gas while the system is in operation. Any damage to the diaphragm — even a tiny crack or pinhole — would prevent it from performing these functions. And continuous exposure to the gas would cause these problems if the REGAL diaphragm were not twice as thick and three times as strong as its competition, and made of a plastic that will not corrode.

**CORROSION-PROOF, HEAVY DUTY  
INLET/SAFETY SHUTOFF VALVE SPRING**



Particles small enough to get through the REGAL filter do, in time, build up on the inlet/safety shutoff valve, valve seat, and spring. These, therefore, must be cleaned periodically, and in competitive units this is a tough, time consuming, and costly job. In the REGAL, however, these components are housed in a capsule that can be removed with just a screwdriver and pliers, taken apart for cleaning, reassembled, and put back in place, in less than ten minutes. The heavy duty spring, one of the most critical parts in any gas chlorinator, carries a LIMITED LIFETIME WARRANTY.

We have placed **LIMITED LIFETIME WARRANTIES** against corrosion on the diaphragm and inlet/safety shut-off spring in all REGAL chlorinators and sulphonators.

# REGAL PRODUCTS

## Innovative Systems for Continuous Disinfection

The same quality, simplicity and ease of maintenance has been developed into ALL models of REGAL standard units, switchover systems and high capacity gas chlorinators.

### REGAL Automatic Switchover Chlorinators, Sulphonators, and Ammoniators

The safest, most reliable most economical systems to use when service must not be interrupted but cannot be monitored at all times.

Unlike competitive systems that simply place two of their standard chlorinators on two cylinders and use a separate module to handle the switching over, REGAL gives you chlorinators, sulphonators, and ammoniators that have been specifically designed for switchover service —and do the switching over themselves.

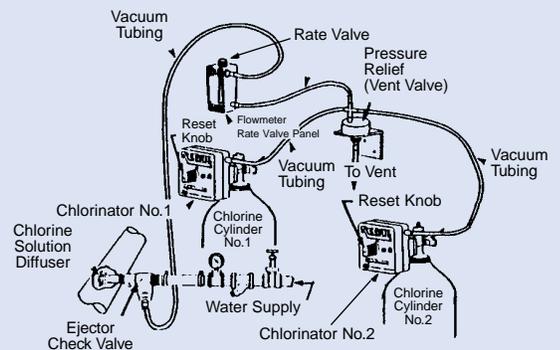
REGAL Switchover Chlorinators, Sulphonators, and Ammoniators have all the reliability factors that standard REGAL units are noted for: the same simple, efficient design. The same heavy duty corrosion resistant or corrosion-proof vital parts.

The basic difference between the standard and switchover REGALS is that the latter also have built-in corrosion-proof and permanently-adjusted switchover latches and reset knobs — which like everything else with the REGAL name, are of essentially simple design.

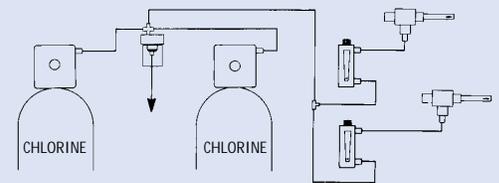
*(By contrast, the wall-mounted, vacuum/differential-pressure regulators required by competitive systems are relatively complex. A failure of any component in these external regulators means a total loss of disinfection — a serious matter if the reason you've installed the switchover system in the first place is that it's left unattended much of the time.)*

Because each unit is complete and self-sustained, you can be sure of feeding a continuous supply of gas no matter what.

In normal operation, one unit supplies gas until its cylinder approaches empty — at which point the other unit starts opening up, keeping the gas supply steady. Should something happen to the operating unit, the other kicks in immediately. There is no interruption of the gas supply.



Automatic Switchover Application  
Models 216, 226, 256, 716, 726, 756, 316



Switchover With Multi-Point Application  
Models 216-2, 226-2, 256-2, 716-2,  
726-2, 756-2, 316-2

## Components to expand your system's versatility.

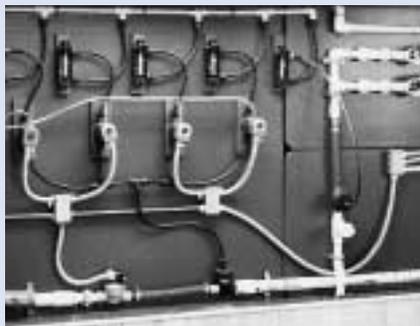
### REGAL Wall-Mounted Chlorinators For Multi-Cylinder Chlorination



When larger reserve and/or feed rate capacities are needed, REGAL offers a choice of wall manifolds interconnecting one or more cylinders or ton containers to a vacuum regulator(s).

However, since direct cylinder mounting is one of the basic safety features of the REGAL Chlorinator, manifolding does reduce its inherent safety. It also adds the hazards associated with pressurized flexible connectors. Manifolding should therefore be avoided if possible.

### REGAL Multiple Application Point Chlorinators



If chlorine or sulfur dioxide is needed at several different places in a water or wastewater system, REGAL has the answer. REGAL multiple application point systems can be furnished with the required number of externally mounted metering tube/rate valve panels and ejectors. Each panel supplies its own ejector and therefore, can be individually adjusted without affecting the others. The only limitation is that the total gas feed rate of the individual feed points cannot exceed the maximum capacity of the supplied system.

In other words, a 100 PPD maximum capacity system can supply gas to one 100 PPD feed point or, to four 25 PPD feed points or, to forty 4 PPD feed points.

### REGAL Ton-Container Mounting Adapter TAY-200



These adapters make it possible for users with continuous feed rate requirements of 500 ppd or less to benefit from REGAL safety, reliability, and economy, and still realize the lower gas costs associated with ton containers.

The REGAL mounts directly on the adapter, with its positive mounting yoke, and the adapter mounts directly on the ton container — eliminating the need for hazardous pressurized flexible connectors, and allowing great flexibility in locating the container.

# REGAL PRODUCTS

Equipment to meet specification requirements.

REGAL'S has a history of innovation and quality recognized worldwide for decades.

This tradition is evident in these accessory items.

## REGAL Model SC401 Dual Cylinder Scale



The REGAL Dual Cylinder Scale provides the only means to measure the amount of chlorine remaining in a cylinder. Accuracy of  $\pm 1\%$  full scale. Surpasses industry standards. Weighs under 65 lbs. Ships via UPS, for arrival in two days. The REGAL Model SC401 is two separate scales in one unit, with adjustable cross-arm with chains. The arm is adjustable up or down, to accommodate different size cylinders. It can handle any cylinder 1 1/4" or less in diameter, with gross weight of 300 lbs. or less, and cylinder tare weight of 80-150 lbs. Factory calibrated and easily assembled and installed on site.

## REGAL Series 3000 Chlorine or Sulfur Dioxide Gas Detector



The REGAL Chlorine or Sulfur Dioxide Gas Detector senses the presence of free chlorine and sulfur dioxide at levels below those mandated by OSHA, and displays the concentration in parts per million on a three-digit display and twelve-LED bargraph. The LED representing the highest detected level stays lit even as the concentration decreases, and all lit LEDs continue to blink until gas concentration subsides to normal levels and the system is reset. The maintenance-free Series 3000 sounds a "warning" alarm at 1 PPM, and a "danger" alarm at 3 PPM (2 PPM and 5 PPM for sulfur dioxide) and transmits digital info for data logging.

## Electronic equipment to meet water and wastewater disinfection demands.

### REGAL Series 7000 SMARTVALVE™



The REGAL SMARTVALVE™ is used for treating water with varying flow rates. Factory-configurable for "flow-proportional" or "step-rate" control mode. Fully automatic or manual operation. Adjustable "low-flow" alarm. Displays flow rate, valve flow position in Pounds Per Day of actual gas feed rate; mode of operation and dosage value. Microcontroller keeps valve linear when dosage is set at 1:1. Chlorine service to 2000 PPD. Sulfur dioxide service to 500 PPD.

### REGAL VAC 1000 Vacuum Monitor



A 100% electronic vacuum monitoring system, with a three-digit display of vacuum in inches of Hg, three LED indicators for High, Low, and Latch, and an additional indicator that warns of a pressure condition.

Other important features include:

- Independently adjustable high and low trip points
- Adjustable alarm delay timer
- Three alarm output relays:  
Two NO/NC Hi/Lo and one NO/NC latch.

### REGAL Series 2000 High Capacity Gas Chlorinators

All the features that have made the REGAL Series 200 low to medium-capacity units the standard of the industry are embodied in the Series 2000 High Capacity Gas Chlorinators.

- They mount directly to the valves of approved gas manifold assemblies.
- They employ the same, safe operating principle: chlorine is drawn through the regulator and metering panel by a vacuum created by water being forced under pressure through an ejector nozzle, and is never under pressure in the system.
- Their simple design uses fewer parts than competitive units; all parts are designed for maximum strength, and are made of corrosion resistant or corrosion proof materials.
- They do not require cabinets, therefore they save space.
- They are quick and easy to service and maintain.
- They can be used in multi-point applications.
- Automatic switchover models are available.

**REGAL SERIES 200 FEED RATES FOR CHLORINE:** Maximum gas feed rate capacities: 4, 10, 25, 50, 100, 250, or 500 pounds per 24 hours (75, 200, 500, 900, 2000, 5000 gms./hr and 10kg/hr). Each unit may be adjusted to a minimum feed rate equal to 1/20th of the maximum capacity.

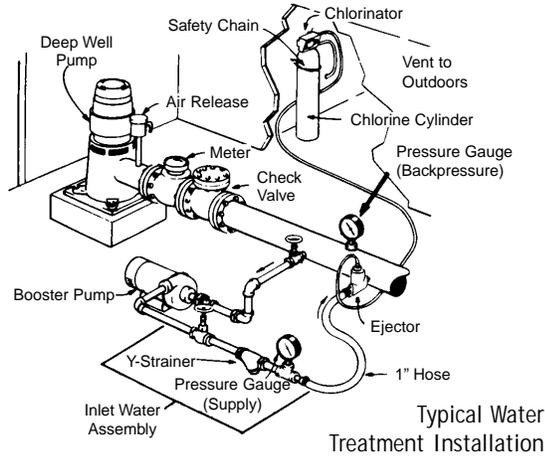
**REGAL SERIES 2000 FEED RATES FOR CHLORINE:** Maximum gas feed rate capacities: 1000 or 2000 pounds per 24 hours (20 or 40 kg/hr.) Each unit may be adjusted to a minimum feed rate equal to 1/20th of the maximum capacity.

# APPLICATIONS

REGAL models and feed rates meet the varied requirements of the full range of water and wastewater applications.

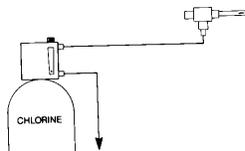
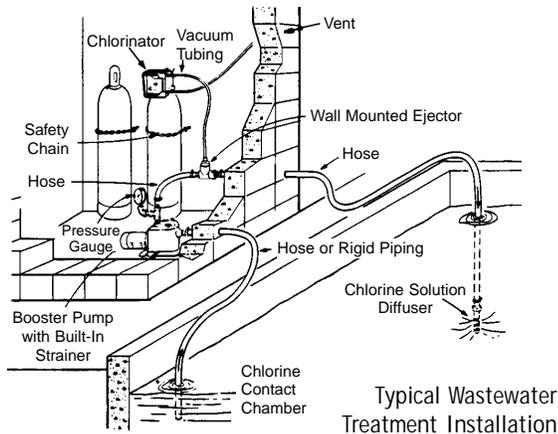
## WATER TREATMENT

- Municipal water systems
- Hotels, motels, hospitals
- Condominiums, trailer parks
- Industrial process water
- Industrial power plants
- Municipal swimming pools
- Club/hotel/resort pools
- Irrigation systems
- Food processing

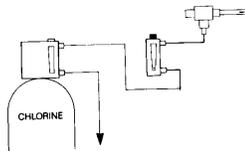


## WASTEWATER TREATMENT

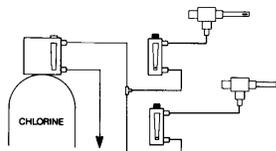
- Package treatment plants
- Municipal sewage plants
- Recycling plants (irrigation)
- Industrial wastewater
- Odor control
- Paper mill plant wastes
- Textile plant wastes
- Plating wastes and contaminants
- Food processing wastes



Single-Point Application  
Models 210, 220, 250,  
710, 720, 750, 310



Remote Metering  
Single-Point Application  
Models 210-1, 220-1, 250-1,  
710-1, 720-1, 750-1, 310-1



Multi-Point Application  
Models 210-2, 220-2, 250-2,  
710-2, 720-2, 750-2, 310-2

REGAL Gas Chlorinators, Sulphonators, and Ammoniators are designed and built exclusively to meet the specialized needs of low-to-medium capacity applications.

 chlorinators incorporated

1044 SE Dixie Cutoff Road, Stuart, FL 34994 USA

Tel: 772-288-4854 • Fax: 772-287-3238 • www.regalchlorinators.com • E-mail: chlorinc@aol.com

Printed in USA

©1999

Chlorinators Incorporated

Pub. No. 1202-7