

Series 70C1710 Cylinder Mounted Chlorinators



CAPITAL CONTROLS



DESIGN FEATURES

- **Modern Design:** Sonic flow differential pressure control requires no moving parts resulting in increased life expectancy and dependability.
- **Inlet Valve Body:** Inlet valve body is composed of Hastelloy® C-22 which has a lifetime guarantee against chlorine corrosion.
- **Versatility:** Optional second vacuum regulator adapts the feeder to automatic changeover without an extra valve. Additional flowmeters and ejectors allow for multipoint application.
- **Vacuum Operation:** Provides safety for operating personnel and equipment. Any leak will cause air to enter the system rather than gas to escape from it.
- **Minimum Maintenance:** Superior design of the ejector with triple back flow protection prevents the back flow of water to the vacuum regulator. Simplicity of design minimizes routine inspection and maintenance time.

The Series 70C1710 Chlorinators are versatile, high quality, low cost, solution feed units which are vacuum operated at sonic conditions. Proven design, rugged construction, and use of the best available materials assure precise gas feeding, low maintenance, dependable operation and long life.

The chlorinator vacuum regulator mounts directly on the cylinder valve by means of a yoke clamp connection. The chlorinator flowmeter assembly may be mounted either on the side of the vacuum regulator or on the wall at the user's convenience. The ejector may be used for systems up to 200 psig (1380 kPa) back pressure.

Automatic changeover systems use two vacuum regulators without the necessity of a separate changeover valve. Multiple meter systems are available for feeding more than one point of application. An out-of-gas switch contact is optionally available. The series 70C1710 chlorinators have maximum feed rates ranging from 1 to 100 lb/day (20 g/h to 2 kg/h). Similar units of different materials may be used for feeding sulfur dioxide or ammonia gases. The maximum capacity of the sulfur dioxide feeder is 100 lb/day and for the ammonia feeder it is 50 lb/day.

ENGINEERING SPECIFICATIONS

Capacities: Standard metering tubes are available with the following maximum capacities: 1, 3, 10, 25, 50 and 100 lb/day (20, 60, 200 and 500 g/h, 1 and 2 kg/h) of chlorine gas. Any combination of capacities may be used on multiple metering tube units as long as the total does not exceed 100 lb/day (2 kg/h).

Flowmeter Rangeability: 20 to 1 for any one metering tube. For example, a chlorinator with a maximum capacity of 50 lb/day can measure and control gas feed over the range from 2.5 to 50 lb/day. Metering tube scale length is 4 inches (100 mm) for easy readability, and is protected from accidental breakage by plastic shield.

Ejector Requirements: Reasonably clean water at pressures of 4 psig (28 kPa) or greater is required to operate the ejector. Water consumption and required inlet pressure are dependent upon chlorinator capacity and ejector discharge pressure (back pressure). Refer to ejector sizing tables (available upon request) for details. An ejector is normally required for each metering tube and rate valve. For swimming pool applications, the ejector with the integral anti-siphon valve must be used. The standard ejector is not suitable for alkaline solutions. For this service a special ejector can be provided.

Mounting: The chlorinator vacuum regulator is mounted on the gas cylinder valve of a 100 or 150 lb chlorine cylinder. Temperature limits on the vacuum regulator are 2°C to 54°C (35° to 130°F). The metering tube assembly may be mounted either on the side of the vacuum regulator or on a wall. The ejector may be wall or pipeline mounted.

If high temperature water is used (above 25°C, 77°F) ejector performance will be impaired due to decreased solubility of the gas and reference should be made to technical bulletin 71.3 for decreased pressure ratings of PVC piping.

Control Modes: Manual adjustment of the rate valve alters feed rate. On multiple meter chlorinators, each meter is equipped with a rate valve. Start-stop control is obtained by installation of an automatic valve in the ejector supply line.

This valve, controlled by a timer, flow, pressure, or pump control device, will start or stop the chlorinator. These chlorinators may be used for multiple or additive rate feed applications through the use of multiple meters and gas or water supply solenoid valves.

Connections:

Ejector Water Inlet: 1-inch NPTE

Solution Outlet: ¾-inch NPTE and 1-inch hose, or 1 ½-inch NPTE and 2-inch hose. Size is determined by water flow required to operate chlorinator. Alternate 1-inch NPTE thread may be used for in-line ejector mounting. This alternate is usually reserved for 100 lb/day max. capacity.

Safety Vent: 5/8-inch tubing.

Materials of Construction: Cyclocac™ Borg Warner Inc., Valox™ General Electric Co., PVC, Silver, Tantalum, Viton™ E.I. Du Pont Co., Hastelloy® Haynes International, Inc., Teflon™ E.I. Du Pont Co., KYNAR® Pennwalt Corp., transparent polycarbonate, and borosilicate glass are used in the construction of the chlorinator and ejector.

Temperature Limits: The corrosion resistant plastics used in the construction of the chlorinator will soften and distort above 130°F (54°C). The ambient temperature must not exceed this maximum allowable limit. Additionally, the temperature of the ejector supply water must not exceed 100°F (38°C).

Shipping Weight: Approximately 7 lb. (3.2 kg) including standard accessories.

Cubage: 1.7 cubic feet (0.005 cubic meters).

ACCESSORIES:

Standard: 50 ft. (15 m) 5/8-inch tubing. 25 additional feet (7.5 m) are provided for automatic changeover systems and for each additional meter.

- Bottle for ammonia solution
- Insect screen for vent line
- Six extra gas filter pads
- Spare gaskets
- Tube of thread lubricant
- Universal wrench

Optional:

- Additional flowmeters and ejectors for multiple point application
- Amperometric titrator (specification 17T2000)
- Automatic changeover system
- Booster pumps
- Chloralert Plus™ chlorine gas detector (specification 17CA3000)
- Conversion kit for wall or ton container mounting
- Diffusers
- Ejectors with integral anti-siphon valve (must be used for swimming pool applications)
- Out-of-gas switch contact (rated at 4A at 120 or 240 V ac)
- Vacuum switches (excess and/or loss of vacuum)

DESCRIPTION OF OPERATION

The chlorine gas from the cylinder enters the chlorinator vacuum regulator where it is filtered to remove any foreign material which might be present. Water flowing through the ejector creates a vacuum which opens the inlet valve to admit the gas into the regulator. A diaphragm regulates the vacuum at this point to a closely controlled value.

The gas passes through the flowmeter(s) and the rate control valves and then goes to the ejector or ejectors where it is thoroughly mixed and dissolved in the water and carried to the application point as a solution. When multiple metering tubes and ejectors are used, each operates independently of the others. Adjustment of one of the gas flow rates has no effect on the other rates.

The system is completely under vacuum from the ejector to the gas inlet valve during operation. If the water supply to the ejector is stopped, or the operating vacuum is lost for any other reason, the spring-loaded gas inlet valve immediately closes to isolate the chlorinator from the gas supply. Any gas, under pressure, which might enter the regulator is vented from the system through the built-in pressure relief valve. If the source of chlorine gas is exhausted, the gas port closes to prevent excessive vacuum levels from developing upstream of the vacuum regulator and also prevents any moisture from being drawn back into the operating components or the gas supply lines.

At the same time, an indicator on the side of the vacuum regulator shows that the gas supply has been exhausted.

When the vacuum regulators are used in an automatic changeover system, either vacuum regulator is selected by the station operator allowing gas to flow until the chlorine source is exhausted. At that point, the second vacuum regulator automatically opens to allow gas feed to continue. Each regulator has an indicator to show whether it is in "reserve", "operating", or an "empty" condition.

Within the ejector there are dual check valves and an emergency drain connection to prevent water from reaching the regulator.

EQUIPMENT DESCRIPTION

The chlorinator shall be a vacuum operated solution feed type with a feed range of _____ to _____ lb/day of chlorine gas. A flowmeter having a 20:1 range shall be provided to indicate the chlorine feed rate. It shall be suitable for mounting on the wall or on the chlorinator vacuum regulator, and equipped with a control valve for manual operation.

The vacuum regulator shall mount directly on the valve of a chlorine cylinder by means of a yoke clamp connection.

A positive tight shut-off valve with Hastelloy® body shall be provided within the chlorinator to isolate gas under pressure from the control system should be a loss of vacuum. An easily removable fiberglass filter shall be included upstream of the inlet valve. A spring-loaded pressure relief valve shall be provided to prevent the build-up pressure within the gas control system. An excess vacuum shut-off valve which isolates the regulator and gas supply system from the ejector on loss of gas pressure shall be supplied. Provisions for automatic changeover shall be incorporated within the vacuum regulator without the need for an external valve. An indicator shall provide a visual signal when the chlorine gas supply is exhausted or interrupted.

The unit shall be supplied with the following accessories: 50 ft. of 5/8-inch polyethylene tubing for vent and vacuum lines, insect screen, bottle for ammonia solution, six spare filter pads, spare gaskets, thread lubricant, and a universal wrench. The chlorinator shall be Capital Controls Company, Inc. Series 70C1710.

Sizing Diskette

An easy to use sizing diskette for chlorinator ejectors, and all water flow meters (closed pipe and open channel types) used to pace automatic chlorinators, is available from Capital Controls Company, Inc. Please contact your nearest sales office.

ORDERING INFORMATION

Please specify the following:

- Model number
- Flowmeter capacity (for each ejector)
- Water supply and back pressure (for each ejector)
- Automatic changeover (if required)
- Number of flowmeters
- Number of ejectors
- Optional accessories
- Maximum pH of ejector water supply

MODEL NUMBER DESIGNATION

	70	17	X	D		X	X	X	X	
Chemical Service										
Chlorine	C									
Sulfur Dioxide	S									
Regulator Mounting and Type of Control										
Cylinder Mtd. w/man. Control		1								
No. of Rate Values and Ejectors										
1	_____									11
2	_____									22
3	_____									33
4	_____									44
5	_____									55
2nd Vac. Reg. for Auto Changeover										
Not Required	_____					X				
Cylinder Mtd.	_____									3
Units										
English	_____									B
Metric	_____									C

Design improvements may be made without notice.

Represented by:



CAPITAL CONTROLS

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