Chlortrol™
Formerly Fischer & Porter

SPECIFICATION

CHEMICAL FEED EQUIPMENT
Series 70C1710

CYLINDER MOUNTED CHLORINATORS (SULFONATORS AND AMMONIATORS)

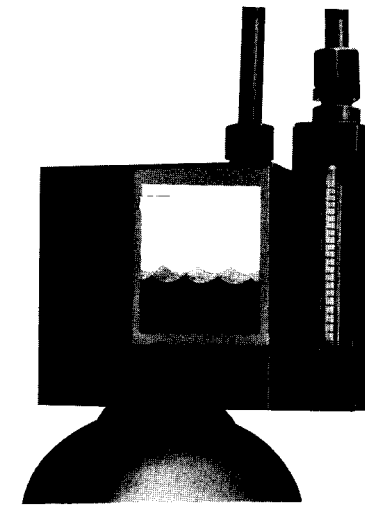
The Series 70C1710 Chlorinators are versatile, high quality, low cost, solution feed units which are vacuum operated at sonic conditions. Proven design, rugged construction and use of the best available materials assure precise gas feeding, low maintenance, dependable operation and long life.

The chlorinator vacuum regulator mounts directly on the cylinder valve by means of a yoke clamp connection. The chlorine 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 change-over 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.

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 mulipoint 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.



Series 70C1710 with Flowmeter Mounted on Vacuum Regulator

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 a 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 is 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 performace will be impaired due to decreased solubility of the gas and reference should be made to Technical Information 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 1½-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: ⅝-inch tubing.

Materials of Construction: Cycolac™ 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 ft^3 (0.05 m^3)

Accessories

Standard: 50 ft. (15 m) ⅝-inch tubing. 25 additional feet (7.5m) 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™ Chlorine Gas Detector (Specification 17CA1000)
Conversion Kit for Wall or Ton Container Mounting
Diffusers
Ejector 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 is 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.

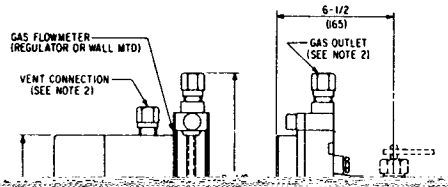
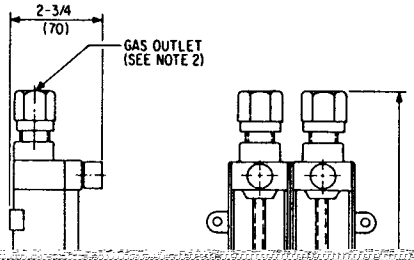
At the same time, an indicator on the side of the vacuum regulator shows that the gas supply has been exhausted.

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.

DIMENSIONS

Vacuum Regulator



Flowmeter