

# CAPITAL CONTROLS®

## Series 70CV2000

### Chloromatic™ Gas Control Valve

The Series 70CV2000 Chloromatic™ control valve is wall mounted and responds to control signals from a water flow transmitter and/or a chlorine residual analyzer controller. Valve characteristics are provided to directly accept a pacing signal proportional to flow.

Automatic control eliminates the need for continuous operator monitoring and manual adjustment of the gas feed rate with changes in flow, especially where chemical discharge levels are regulated. And since manual system feed rates are based on peak flows, automatic feed reduces gas consumption.

Similar units of different materials may be used for feeding ammonia, carbon dioxide and sulfur dioxide gases. The maximum capacities for these feeders are approximately 50%, 75%, and 100% respectively of the chlorinator capacity; e.g., the ammonia feeder is rated at 250 lb/day maximum.

Chloromatic valve is used in conjunction with a vacuum regulator, gas flowmeter and an ejector to provide a complete system. (See Figure 1)



- Integrated circuits and a single corrosion resistant electrical enclosure increase reliability.
- The Chloromatic valve insures positive response to a wide variety of electric signals representing either water flow or chlorine residual measurement. Optionally, both flow pacing and residual control signals can be accepted simultaneously in the Chloromatic valve.



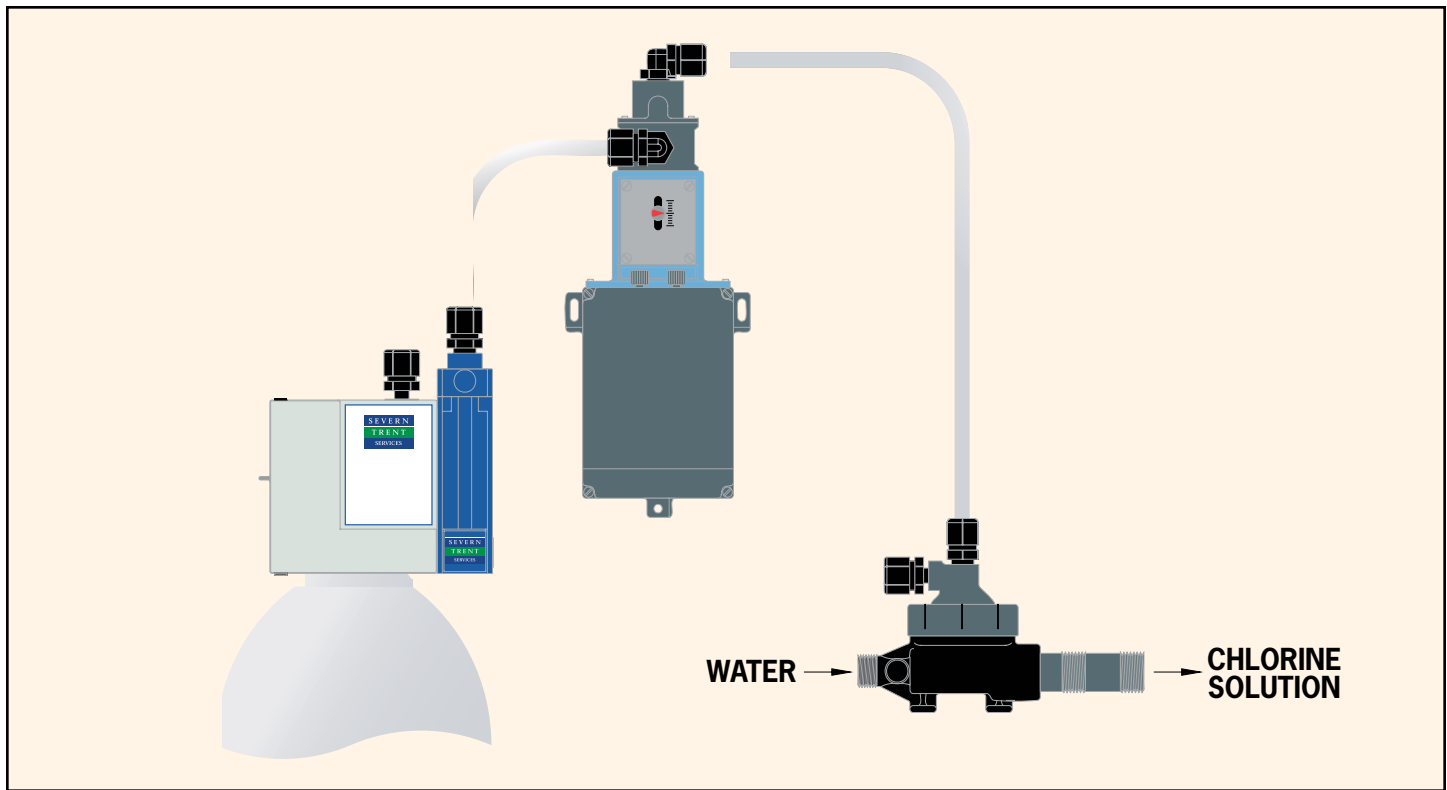


Figure 1

## ENGINEERING SPECIFICATIONS

**Capacities:** Standard maximum capacities are: 10, 25, 50, 100, 200, 300, 500, 1000, 2000, 4000, 6000, 8000, and 10,000 lb/day (200 and 500 g/h; 1,2,4,6, 10, 20, 40, 80, 120, 160 and 200 kg/h) of chlorine gas. See Table 1 for operation and mounting information.

**Control Modes:** All automatic chlorinators utilize the Chloromatic™ valve. This unit has two major components, the control valve and the electric operator. The control valve consists of a housing, a shaped precision plug and a corrosion resistant plastic seat. The plug is positioned with respect to the seat by the valve operator to provide precise control of chlorine feed rates in accordance with the electric input signal(s) to the valve operator.

The control valve operator consists of a solid state electronic circuit, a stepping motor, and a mechanism to position the control valve plug. Two versions of the operator are available; one for a single input signal and one for dual

input signals. The single input valve operator can be adapted to respond to any one of the following signals: 4-20 mA dc; 1-5, 0-4, or 0-5 V dc (normally from a flow transmitter).

The dual input valve operator is designed to respond to any two of the signals listed above. Normally the second signal is from a chlorine residual controller. Within the valve operator an electronic multiplying circuit combines the two inputs into a single motor drive signal. Note that the Chloromatic™ valve does not provide the loop current power source.

A dosage adjustment knob is provided to set the chlorine to water ratio to compensate for differences in chlorine demand. The dosage adjustment is combined with an on-off switch for power shut-off to the motor. On dual input valve operators, a 3-position switch is provided to select the first signal, second signal or dual signals. With power to the motor shut off, the valve can be operated manually by means of a knob connected to the motor drive shaft.

Table 1

| Capacities   | Operation Mode | Mounting               |
|--|----------------|------------------------|
| 10, 25, 50, 100, 200, 300, 500, 1000, 2000, 3000 PPD | Sonic          | Wall or FX4400 Cabinet |
| 1000, 2000, 3000 PPD                                 | Sonic          | FX4400 Cabinet         |
| 1000, 2000, 4000, 6000, 8000, 10000 PPD              | Non- Sonic     | FX5500 Cabinet         |

## SPECIFICATIONS

### Process Connections:

5/8" inlet and outlet vacuum tubing connector up to 500 PPD (10 kg/h).

1" NPT Threaded inlet and outlet connections for 1000 PPD - 3000 PPD.

2" Union connections on inlet and outlet for 2000-10000PPD.

### Power Requirements:

**Voltage:** 120 Vac  $\pm$ 10%; 50/60 Hz  
220/240 Vac  $\pm$ 10%; 50/60 Hz

### Power Consumption:

**Quiescent:** 5 VA maximum  
**Motor Operating:** 18 VA maximum

### Electrical Characteristics:

#### Input Signal:

**Single Input:** 4-20 mAdc, 1-5, 0-4, 0-5 V dc

**Dual Input:** Same as Single

#### Output Signals (optional)

**Retransmission** 4-20 mAdc into 750 ohms maximum

#### High and Low Valve Limit

**Switch Contacts:** Switching (Resistive)  
Power: 60 W, 125 VA  
Voltage: 220 V dc, 250 Vac  
Current: 2 A ac/dc Carrying Current

#### Electrical

**Connections:** (4) 1/2 inch NPT Internally  
Threaded Conduit Entrances

### Environmental Limits:

**Ambient Temperature:** 40 to 125 °F (4 to 52°C)

**Shipping Temperature<sup>1</sup>:** -20 to 125 °F (-29 to 52 °C)

**Vibration Limits:** 5 to 14 Hz @ 0.05 inch p-p disp.  
14 to 200 Hz @ 0.5 g

**Dosage Control:** Output: Input Ratio of 0.2:1 to 2.0:1

**Manual Control:** Manual Control Knob (multi-turn) available to position valve plug when dosage control is in "off" position or if power fails.

### Physical Characteristics

**Outline Dimension:** Approx. 16½ inch L x 7 inch W x 7 inch H

**Weight:** 17 lb. (7.7 kg)

#### Enclosure

**Classification:** NEMA 3R; IEC 529 IP 54

### Materials of Construction:

#### Main Housing & Cover:

Die cast aluminum with baked vinyl finish

#### Valve Plug:

Silver, PVC or Austenitic Stainless Steel (capacity and gas type dependent)

#### Orifice:

Fluorosint (Mica filled Teflon)

## EQUIPMENT DESCRIPTION

The Chloromatic™ valve shall be stepping motor operated with the motor and electronic components mounted in a corrosion resistant enclosure. The electronic components of the operator shall be mounted on printed circuit boards of the latest electrical design including integrated circuits. All circuit boards shall be coated with Humiseal with a minimum thickness of 0.002" to meet the requirements of MIL-E-5272, thus increasing the corrosion resistance of the boards. The primary input signal shall be (4-20) (0-16) (0-20) mAdc or (1-5) (0-4) (0-5) Vdc. With dual signals, a 3-position switch for selecting the first input, second input or dual inputs shall be provided. An electric on-off switch shall be provided and the device shall be equipped with a thumb-wheel which shall quickly position the valve manually without the necessity of disconnecting linkages. The valve shall be wall (cabinet) mounted.

# Chloromatic Valve - Series 70CV2000 - Chlorine, Sulfur Dioxide, Ammonia

| 70CV2                    | A | B | C | B<br>D         | E  | F | FEATURE<br>POSITION |
|--------------------------|---|---|---|----------------|--|---|---------------------|
| <b>POSITION</b>          |   |   |   | <b>FEATURE</b> | <b>DESCRIPTION</b>   |   |                     |
| A Power Requirements     |   |   |   | 1              | 120V   |   |                     |
|                          |   |   |   | 2              | 240V   |   |                     |
| B Signal(s)              |   |   |   | 1              | 4-20 mAdc  |   |                     |
|                          |   |   |   | 2              | 0-16 mAdc  |   |                     |
|                          |   |   |   | 3              | 0-20 mAdc  |   |                     |
|                          |   |   |   | 4              | 1-5 Vdc  |   |                     |
|                          |   |   |   | 5              | 0-4 Vdc  |   |                     |
|                          |   |   |   | 6              | 0-5 Vdc  |   |                     |
|                          |   |   |   | 7              | 1-5 mAdc   |   |                     |
|                          |   |   |   | 8              | 0-4 mAdc   |   |                     |
|                          |   |   |   | 9              | 0-5 mAdc   |   |                     |
| C Chloromatic Valve      |   |   |   | 1              | No Options   |   |                     |
|                          |   |   |   | 2              | Two Alarm Contacts only  |   |                     |
|                          |   |   |   | 3              | Two Alarm Contact, Dual Input  |   |                     |
|                          |   |   |   | 4              | Two Alarm Contact, Retransmission 4-20mA, Dual Input   |   |                     |
|                          |   |   |   | 5              | Two Alarm Contact, Retransmission 4-20mA,  |   |                     |
|                          |   |   |   | 6              | Retransmission 4-20mA only   |   |                     |
|                          |   |   |   | 7              | Retransmission 4-20mA, Dual Input  |   |                     |
|                          |   |   |   | 8              | Dual Input only  |   |                     |
| D Design Level           |   |   |   | B              | Design Level   |   |                     |
| E Maximum Valve Capacity |   |   |   | B              | 10 PPD, (200 g/h) - Cl <sub>2</sub> /SO <sub>2</sub> , NA - NH <sub>3</sub>                                    |   |                     |
|                          |   |   |   | C              | 25 PPD, (500 g/h) - Cl <sub>2</sub> /SO <sub>2</sub> , 10 PPD (200 g/h) - NH <sub>3</sub>                      |   |                     |
|                          |   |   |   | D              | 50 PPD, (1 kg/h) - Cl <sub>2</sub> /SO <sub>2</sub> , 25 PPD (500 g/h) - NH <sub>3</sub>                       |   |                     |
|                          |   |   |   | F              | 100 PPD, (2 kg/h) - Cl <sub>2</sub> /SO <sub>2</sub> , 50 PPD (1 kg/h) - NH <sub>3</sub>                       |   |                     |
|                          |   |   |   | G              | 200 PPD, (4 kg/h) - Cl <sub>2</sub> /SO <sub>2</sub> , 100 PPD (2 kg/h) - NH <sub>3</sub>                      |   |                     |
|                          |   |   |   | H              | 300 PPD, (6 kg/h) - Cl <sub>2</sub> /SO <sub>2</sub> , NA - NH <sub>3</sub>                                    |   |                     |
|                          |   |   |   | J              | 500 PPD, (10 kg/h) - Cl <sub>2</sub> /SO <sub>2</sub> , 250 PPD (5 kg/h) - NH <sub>3</sub>                     |   |                     |
|                          |   |   |   | K              | 1000 PPD, (20 kg/h) - Cl <sub>2</sub> /SO <sub>2</sub> , 500 PPD (10 kg/h) - NH <sub>3</sub>                   |   |                     |
|                          |   |   |   | L              | 2000 PPD, (40 kg/h) - Cl <sub>2</sub> /SO <sub>2</sub> , 1000 PPD (20 kg/h) - NH <sub>3</sub>                  |   |                     |
|                          |   |   |   | M              | 2000 PPD, (40 kg/h) (see Note 1) - Cl <sub>2</sub> /SO <sub>2</sub> , 1000 PPD (20 kg/h) - NH <sub>3</sub>     |   |                     |
|                          |   |   |   | N              | 4000 PPD, (80 kg/h) (see Note 1) - Cl <sub>2</sub> /SO <sub>2</sub> , 2000 PPD (40 kg/h) - NH <sub>3</sub>     |   |                     |
|                          |   |   |   | P              | 6000 PPD, (120 kg/h) (see Note 1) - Cl <sub>2</sub> /SO <sub>2</sub> , 3000 PPD (60 kg/h) - NH <sub>3</sub>    |   |                     |
|                          |   |   |   | R              | 8000 PPD, (160 kg/h) (see Note 1) - Cl <sub>2</sub> /SO <sub>2</sub> , 4000 PPD (80 kg/h) - NH <sub>3</sub>    |   |                     |
|                          |   |   |   | S              | 10000 PPD, (200 kg/h) (see Note 1) - Cl <sub>2</sub> /SO <sub>2</sub> , 5000 PPD (100 kg/h) - MJH <sub>3</sub> |   |                     |
| F Gas                    |   |   |   | A              | Ammonia  |   |                     |
|                          |   |   |   | C              | Chlorine   |   |                     |
|                          |   |   |   | S              | Sulfur Dioxide   |   |                     |

## Notes:

1. For use with FX5500.
2. Due to sonic vacuum levels, chloromatic valve must be used with EJ17 for capacities up to 500 PPD.

## Reference:

|                      |                      |                      |                  |
|----------------------|----------------------|----------------------|------------------|
| Instruction Manuals: | 100.6610, 6620, 6630 | Product Literature:  | 100.0310         |
| Parts Lists:         | 100.6610             | Technical Documents: | ID-70-1246       |
| Dimensions:          | OD-70-5034           | Volume:              | 0.5 cf (0.012cm) |
| Weight:              | 15 lbs. (6.8 kg)     |                      |                  |

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