CAPITAL CONTROLS® SERIES WP70CV3 GAS FEEDERS

The Capital Controls® Series WP70CV3 gas feeders are wall panel mounted and vacuum operated.

Easy to install, each Series WP70CV3 wall panel feeder is factory tested and needs no field adjustment prior to start-up. Eleven different flowmeter capacities ranging from 5 to 3000 PPD (100 g/h to 60 kg/h) provide versatility in meeting gas flow requirements.

The WP70CV3 wall panel feeder includes the Capital Controls Series 70CV3000 Chloromatic™ Intelligent Gas Flow Control Valve, gas flow indicator and a vacuum gauge mounted on a corrosion-resistent, heavy-duty panel. The WP70CV3 wall panel feeder can be provided with integrally mounted and wired high and low vacuum switches. The control valve receives signals from a water flow transmitter and/or chlorine residual analyzer. Automatic switchover is available to provide for uninterrupted service.

A complete wall panel gas feeder system consists of a wall panel, vacuum regulator and an ejector, or chemical induction unit.

- Safe, reliable all-vacuum operation
- Front access service
- Space-saving wall panel design
- Superior materials of construction
- Variable capacities up to 3000 PPD (60 kg/h)
- Sonic operation - no D/P regulator required
- Microprocessor-based automatic control

For more information on Capital Controls® gas feeders visit **www.denora.com**

DE NORA
our research - your future

We Understand Gas Feeders

Applications

For process water, wastewater treatment and water treatment in the municipal or industrial marketplace

- Disinfection: potable water, municipal wastewater
- Dechlorination: textiles, wastewater effluent
- Slime and algae control: irrigation systems, cooling towers
- Process water: chemical and pharmaceutical manufacture, food (washdown, canning, bleaching, taste and odor control)
- Cyanide, chromium removal: metal finishing wastes
- Zebra mussel control

Design Features

- Modern Design: Superior materials of construction provide durability.
- Reliable: Over 50 years of experience with all vacuum operation, integral venting system.
- Safe: Remote vacuum regulator enhances safety of installation. Vacuum regulator has a separate independent vent and integral pressure relief device.
- Versatile: Cylinder, wall or ton container mounting of vacuum regulator.
- Automatic Switchover: Each vacuum regulator has a built-in automatic switchover function permitting uninterrupted operation. A switchover lever provides visual indication of which gas source is on line. An optional out of gas switch can be provided to remotely indicate switchover status.

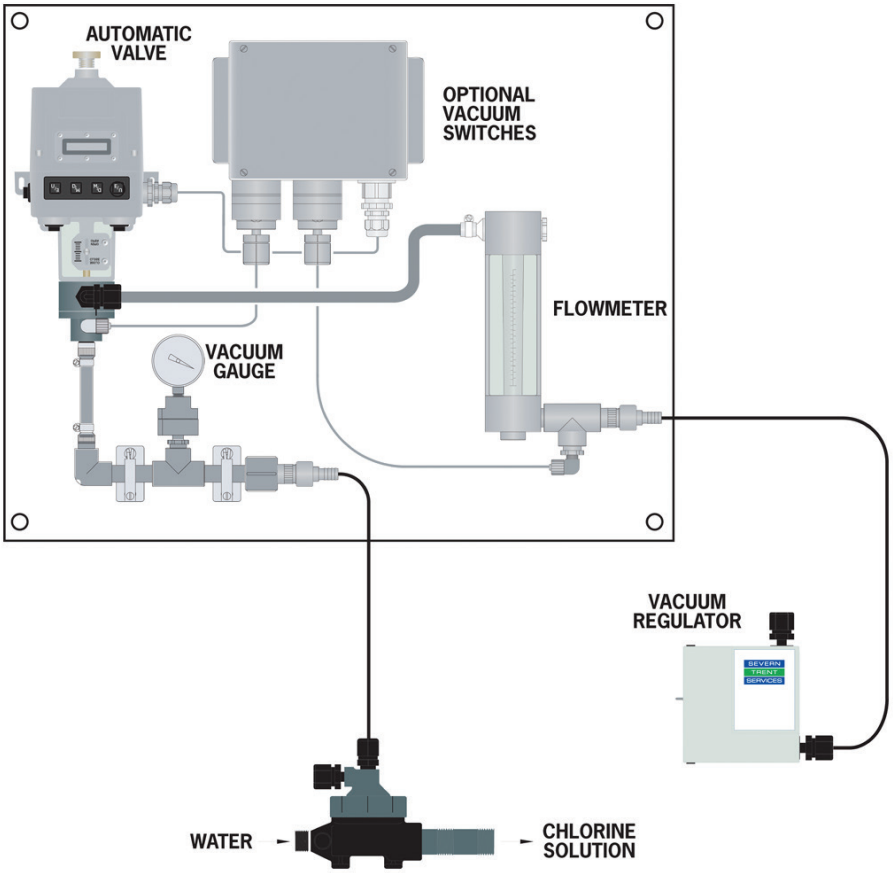

Figure 1 - Automatic Gas Feed System

OPERATION

Vacuum Regulator

Water flowing through the ejector venturi, creates a vacuum which opens the check valve in the remote ejector. The vacuum is carried through the vacuum line to the vacuum regulator where the differential pressure causes the inlet valve on the vacuum regulator to open, initiating gas flow. A spring opposed diaphragm in the vacuum regulator, regulates the vacuum. The gas passes under vacuum through the panel mounted flowmeter and rate control valve. Sonic operation maintains a constant differential across the rate control valve without the need for a differential pressure regulator. Gas flows through the vacuum line and to the ejector where the gas is thoroughly mixed with the water and applied as a solution. (Figure 1)

The system is completely under vacuum from the ejector to the vacuum regulator inlet safety valve. If the water supply to the ejector stops or vacuum is lost for any reason, the spring loaded inlet safety valve immediately closes and isolates the pressure gas supply. If the gas source is depleted, the unit seals to prevent moisture from being drawn back into the gas source.

Automatic Control

The wall panel is designed for automatic control when variable flow and residual demand conditions are present. The Capital Controls® 70CV3000 automatic valve will open and close in proportion to a signal received from the internal microprocessor-based control module. The controller receives electrical input signals from a flow meter and/or residual analyzer, along with a remote set-point signal causing the controller to automatically reposition the control valve to maintain the desired gas feed rate or chlorine residual.

The Capital Controls 70CV3000 control valve is field configurable for three chlorination and two dechlorination control modes:

- Flow: Proportioning valve position to process flow.
- Residual: Single, integral action, adjusting valve based on the difference between the process and the residual set point.
- Compound Loop: Simultaneous proportioning valve position to a combination of flow proportioning and residual control. If one signal is lost, the controller automatically controls based on remaining signal.
- Feed Forward: Valve position control directly proportional to flow signal multiplied by the residual signal. Automatic wall panel units include: automatic control valve with integral controller, flowmeter, vacuum gauge and optional vacuum switches.

For uninterrupted gas feeding on a round-the-clock basis, an automatic switchover system is provided. Gas flows under vacuum from the regulator in service until that source is depleted, then the switchover function automatically switches service to the standby source. The standby supply will not be accessed until the in-service supply is exhausted.

We Understand Gas Feeders

TECHNICAL DATA

Quality Standards: ISO 9001 Certified

Appovals: Actuator - CE, CSA

Capacities: Standard maximum capacities are: 5, 10, 25, 50, 100, 200, 300, 500, 1000, 2000 and 3000 PPD (100, 200 and 500 g/h; 1, 2, 4, 6, 10, 20, 40 and 60 kg/h) of chlorine gas.

Process Connections:
- 200 PPD Max; 3/8", 1/2" or 5/8" tubing
- 500 PPD Max; 5/8" tubing
- 3000 PPD Max; 1" NPT

Power:
Voltage Requirements: 100-250 Vac; +10%/-15%
Frequency: 50-60 Hz
Quiescent power consumption: 12 VA maximum
Operating power consumption: 38.5 VA maximum

Electrical Characteristics:
Inputs:
- **Residual analyzer and/or Flow Transmitter:** two (2)
- 4-20 mAdc or 1-5 Vdc (field selectable) with dampening adjustable from 0-25.5 seconds (field selectable) (isolated)
- **Remote set point (local/remote):** one (1) 4-20 mAdc or 1-5 Vdc (field selectable) (isolated)
- Vacuum switch alarm contact, one (1)
- Remote standby switch contact, one(1)

Outputs:
- **Relay contacts:** three (3) 5A resistive at 120 Vac SPDT field configurable for NO/NC.
- **Contacts field configurable for:** fault alarm (malfunction or power failure), auto/manual state, local/remote set point, residual HI, residual LO, set point deviation HI, set point deviation LO, water low flow, valve position HI, valve position LO, valve stall, standy, vacuum HI/LO.
- **Calibrated Gas Flow Transmission:** one (1) 4-20 mAdc, maximum load 1000 ohms

Electrical Connections: (6) ¾" NPT Internally Threaded Conduit Entrances
Field Terminals: Up to 14 AWG
Environmental Limits:
Ambient Temperature: 40°F to 125°F (4°C to 52°C)
Shipping Temperature: -20°F to 125°F (-29°C to 52°C)

Control:
Modes of Operation:
Auto/Manual: Auto - run by control mode, Manual - use up/down pushbuttons
Local/Remote: Local – set point adjusted at controller, Remote – corresponds to input signal
Control Modes: Field selectable for flow proportional, residual, compound loop and feed forward
Dosage Control: Output: Input Ratio of 0.2:1 to 2.0:1
Manual Override: Manual Control Knob (multi-turn) provided to position valve plug when dosage control is in "off" position or if power fails.

Display:
- 2x16 characters, vacuum fluorescent display
- Displays operational parameters as well as alarm conditions
- Four pushbuttons for display and parameter setup

Data Retention: Parameters and calibration profiling are stored in EEPROM

Physical Characteristics:
Outline Dimension:

- 200 & 500 PPD (4 & 10 kg/h) w/out vacuum switches; approx.
- 24" H x 20" W x 8" D (61cm H x 51cm W x 21cm D)
- 3000 PPD (60 kg/h) w/out vacuum switches; approx.
- 28" H x 22" W x 8" D (71cm H x 56cm W x 21cm D)
- 200 & 500 PPD (4 & 10 kg/h) w/vacuum switches; approx.
- 24" H x 30" W x 8" D (61cm H X 76cm W X 21cm D)
- 3000 PPD (60 kg/h) w/vacuum switches;
- 28" H x 28" W x 8" D (71cm H x 71cm W x 21cm D)

Weight:

- 200 & 500 PPD (4 & 10 kg/h) w/out vacuum switches; 26 lbs (12 kg)
- 3000 PPD (60 kg/h) w/out vacuum switches; 38 lbs (17.3 kg)
- 200 & 500 PPD (4 & 10 kg/h) w/vacuum switches; 35.5 lbs (16 kg)
- 3000 PPD (60 kg/h) w/vacuum switches; 46.5 lbs (21 kg)

Enclosure Classification: NEMA 4X; IP 66

Materials of Construction:
Valve:

Main Housing & Cover: Cast aluminum with fusion bonded epoxy powder coat
Valve Plug: Silver, Kynar, PVC or Austenitic Stainless Steel (capacity and gas type dependent)
Orifice: Fluorosint (Mica filled Teflon)

Vacuum Switches: Steel with powder coat

Panel: Polyethylene

We Understand Gas Feeders

Brief Specification

The gas feeder design shall be of the vacuum operated, solution feed type. The polyethylene wall panel shall contain the automatic control valve with integral controller, gas flow indicator and (optional) high and low vacuum switches.

The gas feeder shall be constructed of materials suitable for wet or dry gas service. All utility inlets and outlets are located on the base of the panel. The vacuum regulator shall be remotely mounted.

The Gas Flow Control Valve shall be stepping motor operated with the motor and electronic components mounted in a NEMA 4X enclosure. The valve shall be integrated with a microprocessor-based controller designed to control chemical feed. The valve shall be field configurable for flow proportioning, residual, compound loop or feed forward control. The compound loop control feature shall have the capability of automatic variable lag time adjustment. All setup, tuning and control adjustment shall be achieved from the pushbutton panel.

Standard features shall include: built-in multiplier for feed forward control: automatic transfer from compound loop control when either the residual or flow signal is lost; bumpless transfer between manual and automatic control, digital vacuum fluorescent display; alarm indication; user configurable alarm contacts; control switch inputs; and a 4-20 mAdc flow transmitter output signal.

The valve shall incorporate a unique 11 point valve plug characterization feature that matches the valve plug characteristic to the gas flow meter. This shall insure a true gas flow retransmission signal to remote monitoring instruments such as a recorder or SCADA system without the need for limited range auxiliary differential pressure metering devices. The valve shall operate under sonic gas flow conditions. The valve shall be able to accept three (3) either 4-20 mAdc or 1-5 Vdc inputs. Inputs shall be field selectable, two (2) for flow transmitter and/or residual analyzer and one (1) for remote set point. There shall be two (2) contact inputs, one shall be for vacuum switch alarm and the other for a remote standby switch.

The display shall be a 2-line, 16 character vacuum fluorescent display. Display shall display operational parameters as well as alarm conditions. The valve shall be powered by 100-250 Vac, 47-66 Hz and shall be auto-ranging. The valve shall be equipped with a manual control knob (multi-turn) available to position the valve plug when dosage control is in "off" position or if power fails.

The optional vacuum switches shall be wired to the automatic control valve and have auxiliary contacts available for remote status indication. The vacuum switches shall monitor the vacuum levels from the vacuum source and the vacuum level between the panel and the vacuum regulator.

The gas feed panel shall be able to feed chlorine, sulfur dioxide, ammonia or carbon dioxide gases. The maximum feed rate (as chlorine) shall be 3,000 PPD (60 kg/h).

The Intelligent Gas Flow Control Valve shall be De Nora Water Technologies Capital Controls® Series WP70CV3.

Warranty and Capability

There is a one (1) year limited warranty on Series WP70CV3 equipment.

De Nora Water Technologies is ISO 9001 certified to provide quality and precision materials. Disinfection technologies, water quality monitors and instrumentation for water and wastewater are areas of specialization. Over 50 years of industrial and municipal application experience in the water and wastewater industries is incorporated into the equipment design to provide high quality comprehensive solutions for the global market.

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