

CAPITAL CONTROLS® Series 4100B

Floor Mounted Gas Feeders for Capacities to 3000 lb/day (60 kg/h)

Series 4100B floor mounted cabinet gas feeders are vacuum operated, solution feed, sonic velocity feeders available with either manual or automatic control.



The floor mounted gas feeder is enclosed in a corrosion resistant Polystyrene cabinet.

Ten different flowmeter capacities ranging from 10 to 3000 lb/day (200 g/h to 60 kg/h) provide versatility in meeting gas flow requirements.

Manual Series 4110B gas feed systems consist of a cabinet, vacuum regulator and an ejector, or chemical induction unit.

When automatic control is required (Series 4140B), the CAPITAL CONTROLS® automatic valve responds to control signals from a flowmeter or PLC. If residual or flow plus residual control is needed, the CAPTROL® Model 1451 controller is used. This could be cabinet mounted or remote mounted. The controller receives signals from a water flow transmitter and/or Chlorine residual analyzer. If multiple feed points are required, remote meter panels and additional ejectors are available. Vacuum switchover is available to provide for uninterrupted service to 3000 lb/day (60 kg/h).

- Safe, reliable all-vacuum operation
- Front access to internal components
- Superior materials of construction
- Variable capacities up to 3000 lb/day (60 kg/h)
- Microprocessor based automatic controls
- Accurate gas metering of Chlorine; Sulfur Dioxide, Ammonia and Carbon Dioxide
- Versatile vacuum regulator mounting
- Automatic switchover gives uninterrupted service

Applications

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

Disinfection: Potable water, municipal wastewater

Chloramination: Potable water

Dechlorination: Textiles, wastewater effluent

Cooling water: Control of slime and algae in piping, heat exchangers and cooling towers

Irrigation systems: Slime and algae control

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, textured finish resists fingerprints and dirt.

Reliable: Over 50 years experience with all vacuum operation.

Safe: Remote vacuum regulator mounting enhances safety of installation.

Versatile: Cylinder, ton container, wall or manifold vacuum regulator mounting in units up to 500 lb/day (10 kg/h). Unit can be provided with manual or automatic control. Variety of ejectors available for all applications.

Automatic Switchover: A vacuum operated switchover is built into the vacuum regulators and is available up to 3000 lb/day (60 kg/h).

Technologically Advanced: The CAPTROL® Model 1451 controller provides microprocessor-based control and is fully field configurable. The controller accepts a signal from the flow sensor and/or residual analyzer. An automatic linearized gas feeder control valve is provided for reliable control.

Convenient: Controls are located at eye level and are front panel adjustable, with an easily removable front for access to internal components. Saves valuable floor space in new and existing facilities.

Ease of Installation: Simplicity of design and modularized components minimize installation time.

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 cabinet mounted flowmeter and rate control valve. Sonic velocity of the gas maintains a constant differential across the rate control valve. 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 depletes, the unit seals to prevent moisture from being drawn back into the gas source. When more than one feed point is desired multiple flowmeters and ejectors can be supplied.

For uninterrupted gas feeding on a round-the-clock basis, an automatic switchover system is provided (up to 3000 lb/day [60 kg/h]). Gas flows under vacuum from the regulator in service until that gas source is depleted, then the regulator automatically switches service to the standby gas source. The standby gas source will not be accessed until the gas source in service is exhausted.

Chemical Induction Units

CAPITAL CONTROLS® CHLOR-A-VAC® Series 1420 chemical induction units offer improved chlorination and dechlorination through the high-efficiency mixing of gaseous chemical with process water. This translates into operating and chemical cost savings.

CHLOR-A-VAC® units produce a vacuum when process water passes through water inlet ports and through a venturi. The high vacuum and recessed impeller create great turbulence and complete chemical mixing.

A chemical induction unit in lieu of an ejector should be considered for the following applications: contact basins, headwater, return sludge processes, clarifier inlets, collection basins, equalization tanks and clear wells. (See Bulletin 130.0001)

Automatic Control

Automatic Series 4100B cabinets are supplied with a linear gas feed control valve. When connected to an external flowmeter or controller, the feeder will operate in the flow paced control mode.

For variable flow and demand conditions, automatic gas flow control is recommended. An automatic valve is provided to open and close in proportion to a signal received from the flowmeter or controller (Figure 2). The controller receives electrical input signals from a flow meter and/or residual analyzer, causing the controller to automatically reposition the control valve to maintain the desired gas feed rate or chlorine residual.

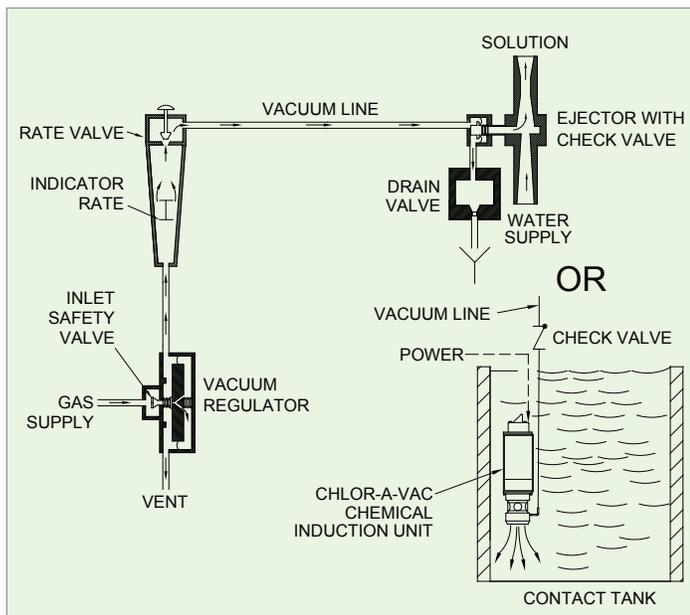


Figure 1 - Model 4110B - Manual Gas Feed System

The CAPTROL® Model 1451 microprocessor controller is field configurable for three chlorination and two dechlorination control modes:

Flow: Proportioning valve position to process flow. (The CAPTROL® Model 1451 not required, auto valve has flow controller.)

Residual: Single, integral action, opening valve based on 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 proportions based on remaining signal.

Feed Forward: Valve position control directly proportional to flow signal multiplied by residual signal, provided by built-in multiplier.

Automatic floor cabinet units include: Automatic linear gas feeder control valve that operates in the flow paced control mode. The CAPTROL® Model 1451 controller, if ordered, can be remote wall mounted or attached to the cabinet with an optional bracket.

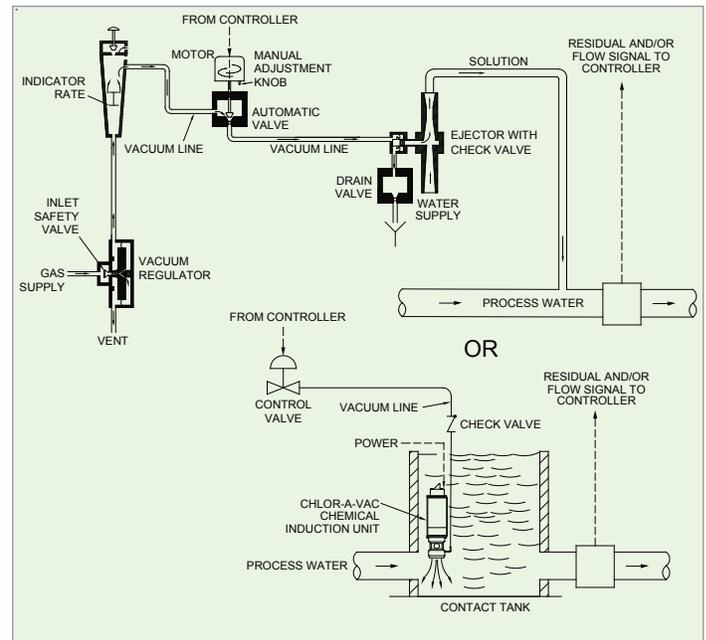


Figure 2 - Model 4140B - Automatic Gas Feed System

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Technical Data

General

Capacities: Standard metering tubes are available with the following capacities 10, 25, 50, 100, 200, 300, 500, 1000, 2000 and 3000 lb/day (200 g/h, 500 g/h, and 1, 2, 4, 6, 10, 20, 40 and 60 kg/h) of Chlorine gas. To determine feed rates for other gases, multiply each Chlorine value by:

0.95 for Sulfur Dioxide

0.50 for Ammonia

0.78 for Carbon Dioxide

Flowmeter: The minimum feed capacity for every gas flowmeter is 1/20th of the maximum capacity for manual units and 1/10th of maximum capacity for automatic units.

Accuracy: Within $\pm 4\%$ of maximum flowmeter capacity.

Electrical Requirements: 120/240 Vac, 60/50 Hz, single phase

Dimensions: 56 1/2" (1435 mm) H x 24" (610 mm) W x 13 1/2" (343 mm) D

Warranty and Capability

De Nora Water Technologies warrants its Series 4100B floor mounted gas feeders for eighteen (18) months from date of invoice, or twelve (12) months from date of installation, whichever expires first.

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.

Brief Specification

The floor mounted cabinet gas feeder shall be provided with a maximum capacity of 3000 lb/day (60 kg/h) Chlorine gas per day. The gas feeder shall be vacuum operated and shall convey the gas under vacuum from the vacuum regulator to the ejector/check valve assembly to maintain complete system safety.

The gas feeder shall be housed in a floor cabinet constructed of corrosion resistant Polystyrene. The cabinet front shall be removable to permit access to the internal components. The cabinet shall house a dual scale (English/metric) gas flowmeter and an automatic control valve and be sized for an operating maximum capacity of 3000 lb/day (60 kg/h). The cabinet shall also include a vacuum gauge. The automatic controller can be remote wall mounted or attached to the floor cabinet with an optional bracket. The vacuum regulator shall be mounted remotely from the floor cabinet for safety.

All components carrying gas shall be made of materials suitable for wet or dry gas service. All springs shall be of Hastelloy C construction. The automatic valve plug shall be of materials suitable for the specified gas. The cabinet mounted feeder shall be CAPITAL CONTROLS® Series 4100B or equal.

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info.dnwt@denora.com

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