

# CAPITAL CONTROLS® Series 5200B

## Floor Mounted Gas Feeders for Capacities to 10000 lb/day (200 kg/h)

Series 5200B floor mounted cabinet gas feeders are vacuum operated, solution feed, differential pressure regulated feeders available with either manual or automatic control. The floor mounted gas feeder is enclosed in a corrosion resistant Polystyrene cabinet.



Six different flowmeter capacities ranging from 1000 to 10000 lb/day (20 kg/h to 200 kg/h) provide versatility in meeting gas flow requirements.

Manual Series 5210B gas feed systems consist of a cabinet, vacuum regulator and an ejector, or chemical induction unit. When automatic control is required (Series 5240B) the CAPITAL CONTROLS® automatic valve, responds to control signals from a flowmeter or a PLC. If residual or flow plus residual control is needed, the CAPTRON® Model 1451 controller is used. The cabinet mounted controller receives signals from a water flow transmitter and/or chlorine residual analyzer. If multiple feed points are required, flow meter assemblies and additional ejectors are available.

- Safe, reliable all-vacuum operation
- Front access to internal components
- Superior materials of construction
- Variable capacities up to 10000 lb/day (200 kg/h)
- Manual bypass rate control valve
- Microprocessor based automatic controls
- Accurate gas metering of Chlorine; Sulfur Dioxide; Ammonia or 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:** High capacity wall mount vacuum regulators are available for feed rates from 2000 to 10000 lb/day (40 - 200 kg/h). Unit can be provided with manual or automatic control. Variety of ejectors available for all applications.

**Automatic Switchover:** A separate, independent vacuum operated device that does not require manual reset is available for capacities up to 4000 lb/day (75 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 bezel 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. Factory assembled, pre-wired, pre-piped (where necessary) and tested requiring only utility connections.

### 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. A differential pressure regulator 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 is depleted, the unit seals to prevent moisture from being drawn back into the gas source. When more than one feed point is desired multiple meter assemblies and ejectors can be supplied.

For uninterrupted gas feeding on a round-the-clock basis, an automatic switchover system is provided (up to 4000 lb/day [75 kg/h]). Gas flows under vacuum from the regulator in service until the gas source is depleted. Then the switchover module 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 5200B cabinets are supplied with a linear gas feed control valve. When connected to an external flowmeter, the feeder will operate in the flow paced control mode.

For variable flow and demand conditions, an automatic controller 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.

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 controller 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 with manual bypass valve and differential pressure regulator. Controller, if ordered, will be mounted inside the floor cabinet.

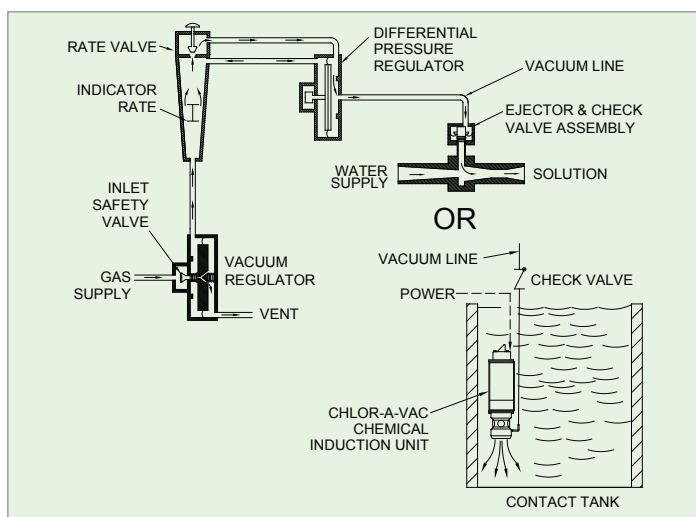


Figure 1 - Model 5210B - Manual Gas Feed System

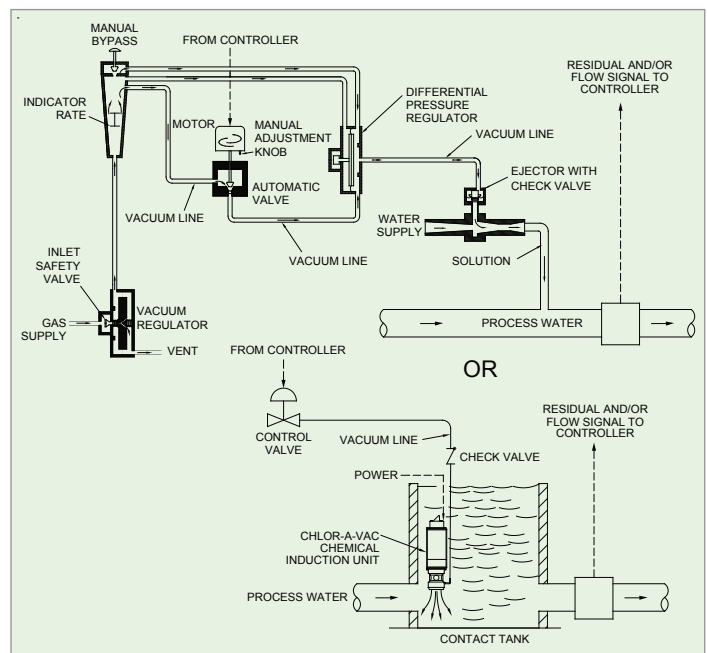


Figure 2 - Model 5240B - Automatic Gas Feed System

# CAPITAL CONTROLS® Series 5200B

Floor Mounted Gas Feeders for Capacities to 10000 lb/day (200 kg/h)

## Technical Data

### General

**Capacities:** Standard metering tubes are available with the following capacities 1000, 2000, 4000, 6000, 8000 and 10000 lb/day (20, 40, 75, 120, 150, and 200 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:** 64" (1627 mm) H x 31" (784 mm) W x 21" (533 mm) D

## Warranty and Capability

De Nora Water Technologies warrants its Series 5200B 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 cabinet mounted gas feeder shall be provided with a maximum capacity of 10000 lb/day (200 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 10000 lb/day (200 kg/h). The cabinet shall also include a manual gas flow control valve, differential pressure regulator, vacuum gauge and vacuum alarm switches. The automatic controller shall be mounted inside the floor cabinet. 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 gas feeder shall be CAPITAL CONTROLS® Series 5200B or equal.

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