

Wallace & Tiernan[®] Gas Feed Systems Equa-Draw[®] System for Vacuum-Manifold Supplies

Introduction

The use of all-vacuum operation has improved the safety and reliability of chlorination and other gas-feed systems used in water and wastewater treatment. Since all gas lines and control equipment are under vacuum, a leak or break in any component results in the loss of operating vacuum and the shut down of the gas feed system. The release of gas to atmosphere is minimal.

To provide this safe system at higher feed rates, it is necessary to manifold a number of supply containers or cylinders together to achieve the desired gas withdrawal rate. Due to temperature variations, friction loss, or vacuum regulator manufacturing tolerances, however, vacuum manifolded containers may experience an uneven withdrawal rate, resulting in premature switchover and wasted chemical. Manual balancing of the flow from each regulator can help to solve this problem, but this can be impractical and costly. Now there is the Equa-Draw[®] System from the Wallace & Tiernan[®] range of products that automatically balances the flow from vacuum manifolded gas supplies and provides for the equal drawdown of all manifolded containers. The innovative Equa-Draw[®] System can be used in any gas feed system to facilitate the vacuum manifolding of multiple gas containers.

Key Benefits

- Easily retrofitted to installations where unequal withdrawal rates are a chronic problem
- Modular design provides easy field modification to add or remove modules
- Automatic operation requires no operator monitoring or adjustment
- A balanced withdraw rate from all manifolded containers regardless of changes in system feedrate
- Requires no electrical power or external power source
- Uninterrupted feed rate with the use of the Series 55-400 non-isolating automatic switchover eliminates the need for manual bypass valves and ensures completely empty supply containers
- Suitable for use with Chlorine or Sulfur dioxide gases in cylinders or ton containers.
- Long life operation



Product Sheet

Design

The Equa-Draw® System can be used in new systems or retrofitted into existing installations that are already vacuum-manifolded or need an upgrade to all-vacuum operation. There are three basic components that are used in a typical, flowbalanced, vacuum-manifolded gas supply system.

Vacuum Regulator

A separate vacuum regulator is mounted on each cylinder or ton container in the active and stand-by supply bank. These can be either the Wallace & Tiernan® standard vacuum regulator Model 210M, for capacities up to 200 ppd, or Model 510M, for capacities up to 500 ppd. These regulators reduce full cylinder supply pressure to a vacuum. A captive yoke connection conforming to Chlorine Institute drawing #189 is used to secure the regulator to the cylinder valve. An integral pressure relief valve is included with each vacuum regulator.

Equa-Draw® Module

One Equa-Draw® module is required for each gas container in the supply bank. The modules are interconnected into a wall-mounted unit with external tubing to connect the end units and complete the balance loop. As the gas flows through each Equa-Draw® unit, its flow rate is automatically regulated to equal the flow rate through adjacent Equa-Draw® units. The effect of this is the even withdrawal of gas from all manifolded containers, regardless of pressure or temperature variations between the supplies. Once the gas exits the units, the discharge lines are manifolded together and eventually connected to the inlet of a gas chlorinator.

Series 55-400 Automatic Switchover Unit

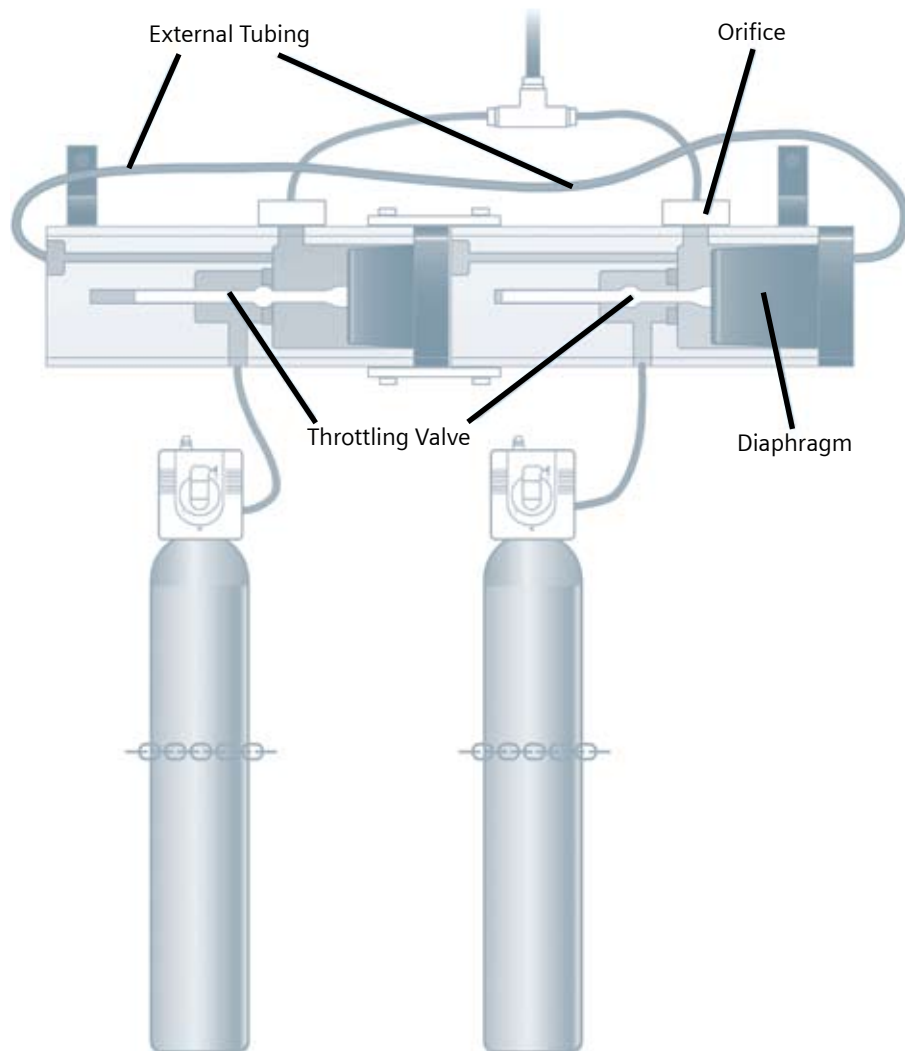
This unit provides for unattended, automatic switchover from the depleted supply bank to the full, stand-by bank of cylinders. This ensures an uninterrupted supply of gas and continuous disinfection. Switchover is initiated automatically as the vacuum level increases in the system due to the depletion of the gas supply. The 55-400 unit is nonisolating, which means that residual gas continues to be withdrawn from the depleted bank until the cylinders are completely empty. Manual by-pass valves are not required. Combined with the Equa-Draw® System operation, this assures that no gas is wasted or returned to the supplier.



Operation

The operating principal of the Equa-Draw® system is based on monitoring the pressure drop across a fixed, metering orifice. This pressure drop varies in proportion to the gas flow through the orifice. Each Equa-Draw® module has an identical metering orifice at the outlet just before the individual gas feed lines are manifolded together. If the flow were to increase or decrease through any one of these orifices, in relation to the adjacent orifice, this would be an indication of an uneven withdrawal rate between the gas supply containers. When this occurs, an internal throttling valve is used to equalize the flow rates. This valve is connected to

a diaphragm that compares the pressure of the monitored module with the adjacent Equa-Draw® module. Therefore, any pressure differential between the two modules results in repositioning of the throttle valve to equalize the flows and rebalance the pressure. Additional Equa-Draw® modules can be added, as required, when more containers are added to the supply bank. Since the modules are interconnected, each one is referenced to the adjacent module so that the flow is equalized in all modules. External tubing is used to connect the end modules to complete the balance loop. A second, separate set of modules is connected to the other supply bank of gas containers.



Technical Data

Operational Temperature:

10 to 130° F (-12 to 55° C)

Operational Pressure: vacuum only

Operational Vacuum: 10-50" water

Maximum Flow Rate per Module:

500 lbs./day chlorine

500 lbs./day sulfur dioxide

Materials of Construction: PVC, TFE, Viton®

Airborne Noise Emission:

Does not exceed 70dB (A)

Dimensions:

See Cat. Nos. WT.055.450.100.UA.CN
& WT.055.450.102.UA.CN

Inlet & Outlet Connections: ½" NPT

Typical Installation:

See Cat. Nos.

WT.055.450.200.UA.CN, WT.055.450.204.UA.CN
and WT.055.450.206.UA.CN

Weight: 8.5 lbs. (4 kgs.) per module

Siemens
Water Technologies

USA
+1 856 507 9000
wtus.water@siemens.com

© 2008 Siemens Water Technologies Corp.
Literature No.: WT.055.450.000.IE.PS.1208
Subject to change without prior notice.

Equa-Draw and Wallace & Tiernan are trademarks of Siemens, its subsidiaries or affiliates. Viton is a trademark of DuPont Performance Elastomers LLC. Equa-Draw is protected by US Patents 6,105,598; 6,239,900;6,308,724;6,763,846; 6,900,997 and additional patents pending.

The information provided in this literature contains merely general descriptions or characteristics of performance which in actual case of use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of the contract.