evoqua
WATER TECHNOLOGIES

V10K™ VACUUM GAS FEEDER
WALLACE & TIERNAN® PRODUCTS

V10K™ SYSTEM: PROVEN TECHNOLOGY WORLDWIDE IN USE

Since Charles F. Wallace and Martin F. Tiernan discovered the first chlorine gas feed system in 1913 the Wallace & Tiernan brand is a synonym for safe and reliable disinfection of water.

EXACT DOSING DUE TO V-NOTCH™

The V-notch™ consists of a precision grooved plug that slides through an annular seat. Any position of the plug in the seat results in a specific orifice size and a corresponding feed rate. The large size and configuration of the orifice resists fouling from contaminants in the gas supply. This results in accurate gas flow control and excellent repeatability. Control of this V-notch can be from simple manual operation up to sophisticated automatic control schemes.

All-vacuum operation ensures highest safety

The complete V10k™ gas system operates under a vacuum. A vacuum control valve at the gas supply container reduces gas pressure to a vacuum at once.

Easy readability

The use of large size rotameters provides the highest degree of resolution for accurate indication of feed rate, unmatched by any other manufacturer in a similar capacity gas feed system. The large scale on the rotameter combined with the white background of the mounting frame enhance the resolution.

Convenient, wall mounted design

The V10k system is designed for the operator's convenience. Unlike cylinder mounted gas feeders, the components of the control unit are mounted securely on a wall mounting panel. This provides a stable control platform that simplifies the installation of gas and electrical lines and protects the fragile rotameter from constant handling every time the gas supply is changed. Open-panel mounted components provide for servicing without the need to remove the entire unit from the wall. There is adequate room around the components so that each can be easily taken apart and serviced on the panel.

The V-notch control orifice, field-proven in hundreds of thousands of installations around the world, provides reliable, consistent gas feed at any capacity requirement.

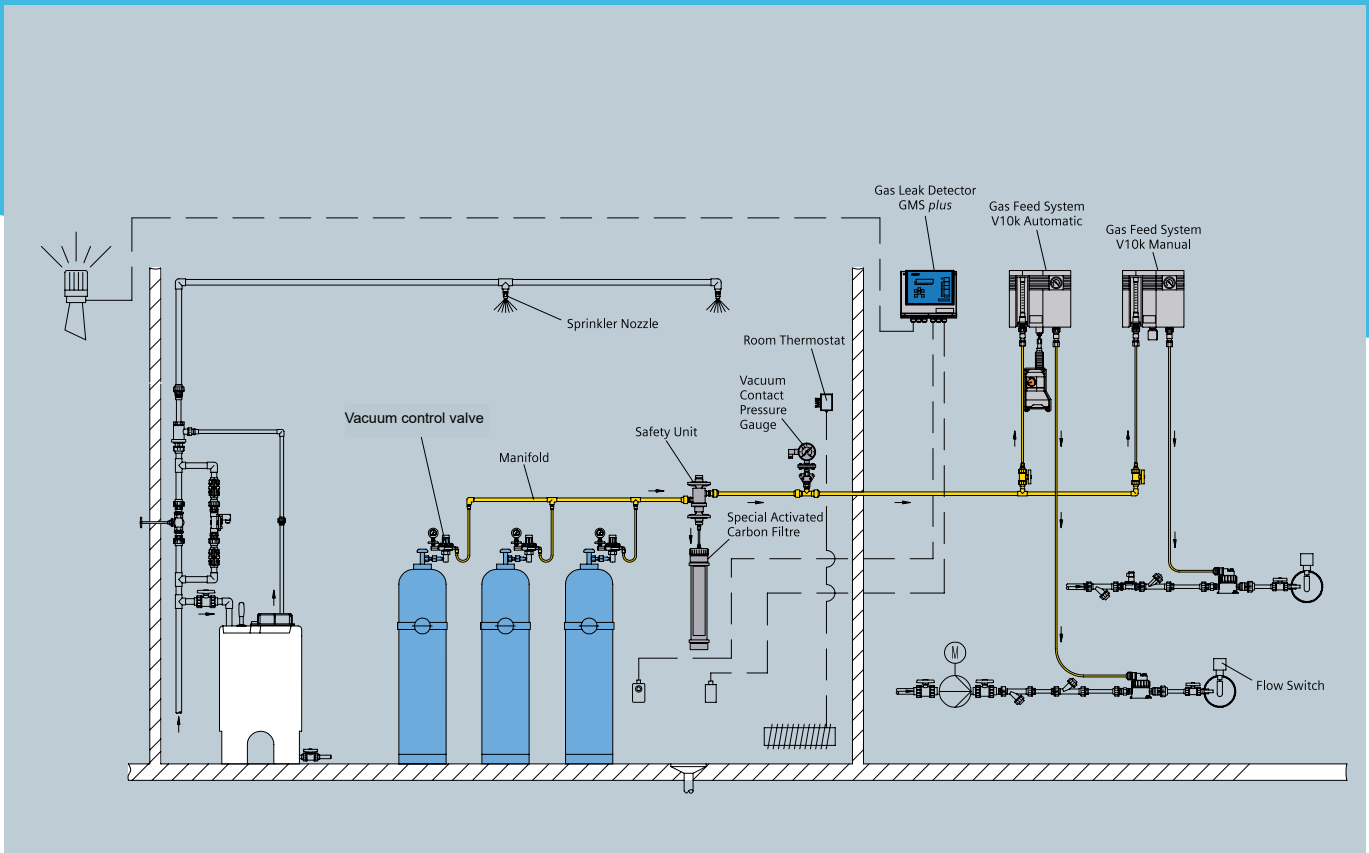
The V10k™ gas feed system is an efficient, low-capacity gas feeder for up to 15 kg/h with a standarized flexible design that provides a variety of configurations. It consists of the following components:

- Vacuum control valve mounted at the gas supply
- Wall-mounted gas control unit with a rotameter for indication of feed rate, differential pressure regulating valve and vacuum gauge for operating vacuum
- Water operated injector that provides the vacuum source to drive the entire system
- Using automatic switch-over regulators an uninterrupted supply of gas (chlorine gas, sulphur dioxide, carbon dioxide) to maintain continuous disinfection treatment is provided.

Applications

There are numerous applications in the municipal or industrial water treatment, the disinfection of potable and swimming pool water, process water in breweries and the beverage industry, the treatment of cooling water and of industrial wastes, high purity water used in industries and much more.

V-NOTCH



OPERATION AND SINGLE ELEMENTS AT A GLANCE

THE INJECTOR CREATES AN OPERATING VACUUM THAT OPENS THE CONTROL VALVES AND LETS THE GAS IN.

1 Vacuum control valve

Vacuum control valves equipped with a pressure gauge and mounted directly on the gas supply containers immediately reduce the pressurized gas to the operating vacuum. The regulator is optionally available with automatic change-over for capacities up to 10 kg/h.

2 Safety unit

The safety vent valve and the vacuum safety valve are combined in the safety unit: It opens the injector only at the correct vacuum level. It additionally protects against a possible pressure build-up in the vacuum system. The integral safety vent valve will release any overpressure to the atmosphere in the case of a failure of the vacuum regulator.

3 Vacuum contact pressure gauge

Will release an alarm in the case of a too high vacuum (gas cylinder empty), or a too low vacuum (insufficient vacuum developed by injector). It can also be used to initiate changeover from empty to full gas cylinders.

4 Rotameter

Large scale rotameter tubes provide clear and accurate indication of the feed rate in g/h or kg/h.

5 Differential regulating valve

Maintains the proper vacuum differential across the V-notch orifice for consistent feed rate, regardless of changes in the operating vacuum, that e.g. can occur through pressure fluctuations in the operating water.

6 Electric positioner for automatic control

For the requirements of an automatic control, the positioner includes the following features:

- Manual changeover from manual to automatic control mode by pulling the knob to disengage the drive motor
- 3 sets of volt-free contacts for system interface – manual; MAX and MIN position
- Internal feedback potentiometer

7 Vacuum gauge

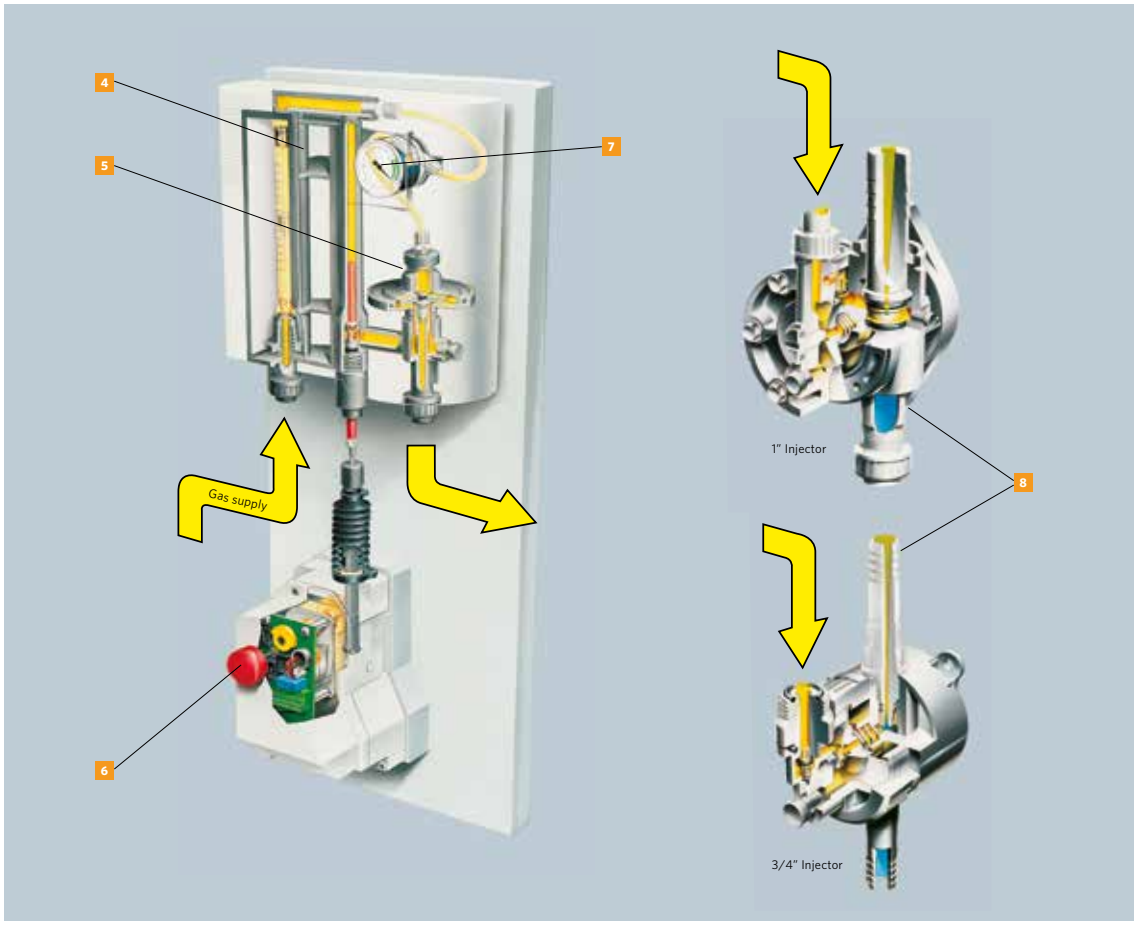
The vacuum gauge provides an easy check of the operating vacuum and injector function.

8 Injectors

Fixed throat injectors create a powerful operating vacuum to drive the V10k™ system. Three injector sizes are available: 3/4" for capacities up to 4 kg/h, 1" for capacities up to 10 kg/h, 2" for capacities up to 15 kg/h. The double check valves protect against backflooding. The main check valve consists of a spring-loaded diaphragm with a spherical seat for positive sealing. A spring-loaded poppet check provides additional safety.

9 GMS *plus* Gas detection system

The two channel measuring system is designed for gas and temperature monitoring in up to two rooms. It controls safety equipment such as a chlorine srubber, a shut off valve or a water spraying system.



CUSTOM-DESIGNED CONTROL MODES

SFC MEASUREMENT AND CONTROL SYSTEM

PRE-ASSEMBLED INSTALLATION OF THE V10K AUTOMATIC SYSTEM

With the V10k™ system the following control modes are available:

- Manual control
- Start/stop or program control through injector water operation (solenoid valve)
- Simple ratio control through a 4–20 mA input
- Chlorine residual control through SFC system
- Flow proportional control through SFC SC flow proportional control
- Compound loop control through SFC PC process controller

SFC SC flow proportional control

The Wallace & Tiernan® SFC SC system is used for flow proportional controlled dosing of chemicals used in water treatment and for similar industrial process applications. It can control automatic V-notch positioners in gas feed systems like the V10k gas dosing system or automatic stroke length positioners and variable speed drives in dosing pump systems.

SFC PC Process control

The SFC PC system controls processes based on a control variable (e.g. flow signal) and an actual measurement value. The measurement signal may be a direct sensor signal or an external mA signal. By using the "fuzzy-logic" auto-tuning control technology at the compound loop control mode the control performance is improved against traditional controllers.

The SFC PC process controller saves its responses related to control deviations and uses this data for future control calculations. So the actuating control output is optimized by fast reaction on flow value and continuously adjusted control parameters through memory data.

V10k manual system

V10k automatic system

3/4″ injector
up to 4 kg/h Cl_2

3/4″ injector
up to 4 kg/h Cl_2
anti-syphon

1″ injector
up to 10 kg/h Cl_2

1″ injector
up to 10 kg/h Cl_2
anti-syphon

2″ injector
up to 15 kg/h Cl_2

4 kg/h
vacuum
control valve

10 kg/h
vacuum
control valve

vacuum
contact
pressure gauge

safety
unit

safety
vent valve

vacuum
safety
valve

FLEXIBLE CONFIGURATIONS:
THE V10K™ GAS FEED SYSTEM IS AVAILABLE IN DIFFERENT DESIGNS

Auf der Weide 10, 89312 Günzburg, Germany

+49 (8221) 904-0 www.evoqua.com

Wallace & Tiernan® Products worldwide

Australia	**Canada**	**China**	**France**	**Germany**	**Singapore**	**UK**	**USA**
+61 3 8720 6597	+1 905 944 2800	+86 10 57076305	+33 1 41 15 92 20	+49 8221 9040	+65 6830 7165	+44 1732 771777	+1 856 507 9000
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