

BENEFITS OF THROTTLE AND BLEED VACUUM CONTROL

The most commonly used vacuum pumps run at one speed. Therefore, the pump is always driving toward the deepest vacuum level possible where they function optimally. Just because this is the sweet spot for your vacuum pump, doesn't mean it's the best vacuum level for your process.

Applications of vacuum technology take place over a wide range of vacuum from ultra-high vacuum all the way up to atmosphere. Most often for industrial vacuum processing, users are ideally looking for a vacuum level that differs from the ultimate pressure of a pump; therefore, a vacuum regulator is needed. Two common methods to control and maintain an acceptable vacuum level are throttle regulation or supplementary gas inlet regulation using a bleed valve.

THROTTLE VACUUM CONTROL

Think of Throttle Vacuum Control as using your gas pedal to vary the speed of your car's engine. In a vacuum system, this type of vacuum control is accomplished by installing a throttle valve which works by throttling the pressure between the vacuum pump and the process in order to control the vacuum level. Sometimes, the use of a throttle valve is referred to as downstream control.



When using a throttling valve to regulate the vacuum level, the valve is a restriction between the two pieces of equipment. It creates a pressure drop between the two, thereby allowing the process to operate at a set pressure while another area's pressure varies based on loading. Valve selection is critical if this type of control is to be practical. This type of vacuum control can be used over a wide range of vacuum pressure.

Looking for a Simple Option for Throttle Vacuum Control?

The [Model 450](#) is a self-contained, vacuum level control unit for maintaining pressures between 2 and 760 Torr. It Works in conjunction with a precision isolated transducer and a proportional solenoid valve to measure and control vacuum. Also, it has a bleed valve that adds bleed control from atmospheric air, or customer supplied gas. The controller mainly utilizes Throttle Vacuum Control but uses Bleed Vacuum Control to maintain a set-point as needed.

The Model 450 constantly monitors system pressure and readjusts the valve orifice to maintain the desired target pressure, even in vessels with dynamic gas loads or changing set-points.



Applications: Ideal for altitude simulation, distillations, composites research and Industrial vacuum processes where repeatability can be translated into better experiments or product yield.

STRATAVAC using Throttle Vacuum Control— DIGIVAC offers the [STRATAVAC Bundle for Throttle Vacuum Control](#)—This bundle comes with a Bellow-type throttle valve which work by throttling the pressure between the vacuum pump and the process in order to control the vacuum level.

Benefits of Bellows-type valve or Plunger Type for Throttle Control: The valve itself is slower acting but has a bigger orifice so you get better throughput given the full KF25 1" orifice. Looking for a faster acting valve with better control? Then you may want the [STRATAVAC Throttle Control with a plunger type valve](#) which comes with 1/8" orifice.

Applications— Short Path Distillation, Vacuum Ovens, Extractions, Vacuum Furnaces, Vacuum Bagging / Composites, Rotary Evaporation

BLEED VACUUM CONTROL

Bleed Vacuum Control on the other hand is ideal in a shorter vacuum range (1×10^{-4} Torr to 10 Torr). Bleed Vacuum Control works on the principle of introducing an artificial load into the system. The artificial load can be air, nitrogen, argon, steam or some other gas. The most reliable method is an inert gas bleed. It is important to utilize a non-condensable vapor rather than a condensable vapor, such as steam, since this type of artificial load will condense in the pump. Commonly, a mass flow controller is used in Bleed Vacuum Control processes.

KEEPING IT SIMPLE

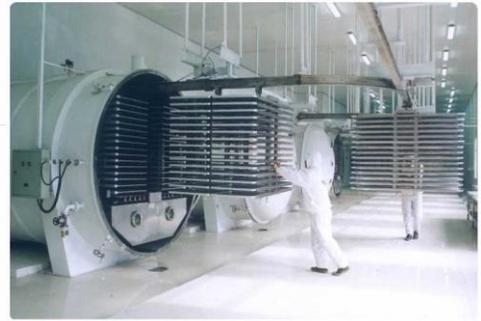
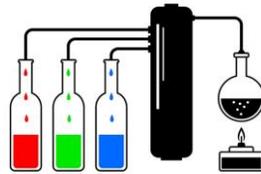
DIGIVAC offers a simple way to conduct Bleed Vacuum Control. The [VacStable Bleed Valve](#) can maintain pressures between 10 milli Torr and 10 Torr and is at an attractive price point compared to mass flow controllers.

This vacuum level controller works on the principal of regulating the bleed of a vacuum vessel to atmosphere much like the way many freeze dryers do. It can be paired with our [STRATAVAC](#) to both measure and maintain vacuum pressure.





- All Metal – Designed for Industrial and R&D
- Accurate Stable Control — This valve has been in use in pharmaceutical and R&D applications regulating vacuum for well over 15 years



APPLICATIONS

The VacStable Bleed Valve is useful for many applications.

- Freeze drying—used heavily in the pharmaceutical industry and in food processing
- Distillations—oil and gas industry and plant oil processing
- Plasma treatment control, calibration station control, vacuum drying vacuum control, vacuum ovens, furnaces



Want to learn more how DIGIVAC can support your Vacuum Process Improvements Needs?

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