Vacuum Holding and Vacuum Table Control

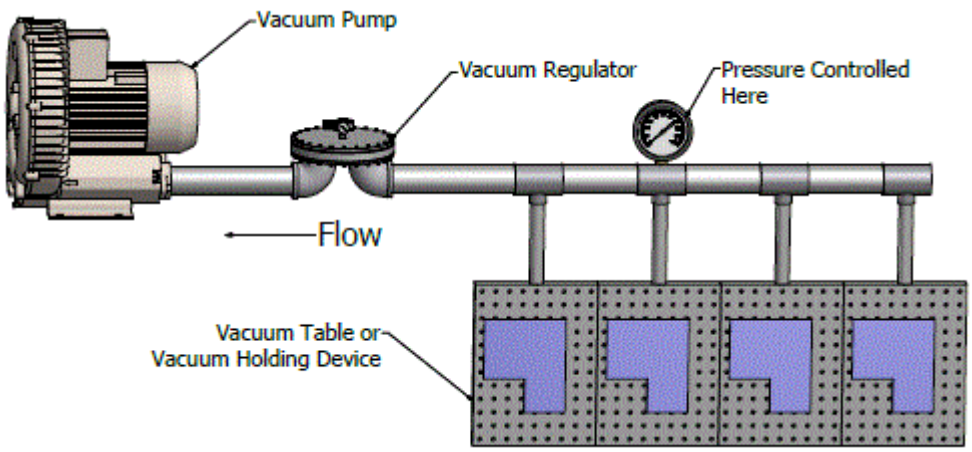
Vacuum tables and other vacuum hold-down applications

The B Series Vacuum Valves are available in 1.5″, 2″, 3″, and 4″ (pipe or flange). Materials are SS316L, Aluminum, or PVC.

A common industrial application for vacuum is that of holding objects during processing or during positioning.

In most vacuum holding applications, flow rate and pressure vary significantly as the number of open holes in the holding system varying during start-ups or disruptions in the manufacturing process. While vacuum applications are tolerant to this pressure variation, many other processes require good vacuum control for optimum operation.

The Equilibar Vacuum Regulator is capable of providing stable pressure across even when the flow rate varies by 100:1 ratio. The schematic below shows the placement of the vacuum valve between the vacuum pump and the vacuum holding process.



Vacuum Table Applications

Vacuum table applications often pose a difficult pressure control challenge, especially when the application involves thin membranes being placed on and off the table. This transient causes the flow rate to fluctuate rapidly in the system, due to vacuum holes being covered and exposed to atmospheric air. In turn, this fluctuation in consumed atmospheric air would cause an unregulated system to fluctuate in vacuum pressure, which proportionally affects the suction force on the sensitive membrane part. This can have large quality control issues, especially if the parts on the vacuum table can be damaged from over-pressurization exposure to high vacuum.

To solve this issue, the solution must include controls that are quick to respond to rapid system changes from parts loading/unloading. This is executed perfectly by the Equilibar Vacuum Regulator. It's ability to immediately open and close as disturbances are sensed on the process side, allowing for high precision vacuum table pressure control.

If the application requires very sensitive vacuum control, often in the inches of water range, the Equilibar performance can be improved further with closed loop feedback. Oftentimes, there will be unavoidable pressure drop in the vacuum table, process piping, or other restrictions that would otherwise throw off precision in open loop control mode. Equilibar offers its vacuum regulators with an electronic or manual pilot regulator, that allow for **remote sensing**.

Closed-loop control with remote sensing offers two key benefits:

- Pressure can be controlled a location further upstream than the actual location of the vacuum regulator
- The capacity and precision of the vacuum regulator is further increased.