FAQs

Aneroid Bellows Assemblies

What are aneroid bellows assemblies?

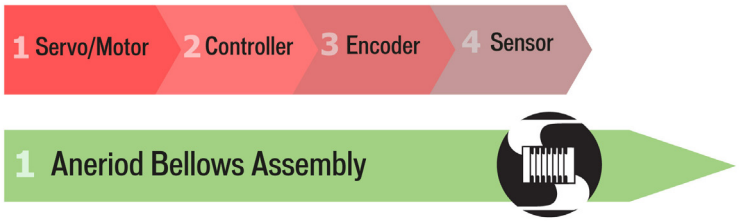
Aneroid bellows assemblies are designed to convert changes in pressure into linear displacement. A bellows is a thin-walled convoluted tube that is leak-tight and can compress or extend axially along its convoluted length. When the bellows is assembled to end pieces that close off the ends, it will then respond when the pressure outside of the assembly is different than the pressure inside. The bellows assembly will react by extending or compressing in precise response to the differential pressure.

Where are aneroid bellows used?

Any application where the designer needs to actuate something in response to a pressure change; altimeters to help sense altitude changes; aircraft fuel valves to modulate fuel mixture as atmospheric pressure changes due to altitude; personal air tanks for HALO jumps to regulate air composition as pressure/altitude changes; depth sensors in undersea applications (especially redundant sensors that need no electrical power). They can actuate relief valves to avoid overpressure in pressurized hydraulic and coolant systems. They can be used to mechanically measure atmospheric pressure.

How do aneroid bellows compare to other technologies?

"As analog solutions in a digital world," aneroid bellows can replace or back up electronic and digital sensors with no electricity needed. Our bellows are more customizable and create fewer potential points of failure.



How do aneroid bellows assemblies work?

By designing the bellows assembly with a specific effective area, wall thickness and stiffness, the bellows assembly will predictably respond to pressure in a linear motion.

How do I implement aneroid bellows in my application?

1. Start with the range of pressures to which the aneroid must respond.
2. Consider how the assembly will be installed in the application.
3. Review the list of standard aneroid assemblies and their size and performance parameters.

What if I need a custom aneroid bellows assembly?

Most in-service aneroid bellows are custom designs. Customers can work directly with engineers to achieve the proper pressure/vacuum actuation, motion profile and end fittings in order to reach the ideal design solution.

What are some other features of aneroid bellows assemblies?

- Stops – Some aneroids are "free" or unstopped, where the assembly's movement is not constrained by any physical feature. It will respond freely and immediately to any change in pressure. Others contain a stop, which restricts compression beyond a certain distance.
- Springs – Many aneroid assemblies include a spring in parallel with the bellows. The bellows and spring each contribute to the overall stiffness of the assembly.
- Adjustment features – Sometimes a thread or a stud, is part of the design. This makes it possible to preload the assembly in the installation, allowing the user to "tune" its performance.

What are some typical ways to specify aneroid assemblies?

An aneroid can be designed to extend or compress a prescribed distance in response to a given range of pressures or altitudes. The product specification can also include the "liftoff" point, which is the critical altitude or pressure where the aneroid first begins to move.

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How are Aneroids tested?

- **Helium leak test** – Leak-tightness is a critical characteristic for any aneroid assembly. Although most aneroids are sealed with vacuum inside, they can be charged with a very low pressure atmosphere of helium. A helium leak detector can be used to test for escaping gas.
- **Bomb test** – Evacuated assemblies are subjected to elevated external pressure in a chamber. When normal pressure is restored if there is a leak, the assembly will grow in length due to the pressure of ingested gas.
- **Liftoff/performance testing** – Using a vacuum chamber, the applied external pressure can be reduced, simulating altitude. Liftoff testing involves measuring the pressure at which the first movement of the aneroid is detected. In a performance test, the pressure in the chamber is modulated while the corresponding dynamic response of the assembly is recorded.