

LEE TECH TALK

TECHNICAL APPLICATION NEWS BRIEF

ZERO LEAK PNEUMATIC SOLENOID VALVES PRESERVE TANK PRESSURE IN MISSION CRITICAL AEROSPACE APPLICATIONS

The Challenge

It is common for aerospace pneumatic systems to be supplied by a tank of compressed gas. In these systems, any leakage or excess flow from the tank results in a shorter system life or the need for a larger tank. As the gas is consumed, the pressure in the tank becomes depleted. A solenoid valve with zero leakage and a wide operating pressure range is needed to provide a barrier between the tank and the system. Various combinations of operating temperature range, material compatibility, power limitations, and life cycle may add complexity to the system requirements.

The Solution

The Lee Company's Zero Leak Pneumatic Solenoid Valves feature a polyimide shaft tip to ensure a bubble tight seal on nitrogen. In a package weighing a maximum of 0.14 lbs. (2.24 oz), the valve's direct acting design operates without pressure assistance and flows up to 30 SLPM of air at 200 psi differential. The 70-ohm solenoid coil requires less than 4 watts to open the valve. Custom configurations are available with 6,000 psid operating capability or qualified for over 1 million cycles.

The Benefits

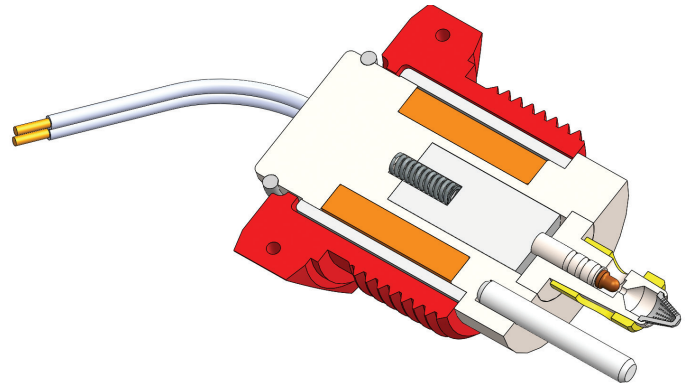
These pneumatic solenoid valves draw on the design elements of The Lee Company's field-proven line of piloting solenoid valves which have pedigree on aircraft, launch vehicle and satellite systems. The Lee MultiSeal® radically simplifies port layout, reduces machining costs and provides superior reliability over traditional sealing methods. The space and weight savings can directly reduce fuel costs. Low power requirements, wide operating temperature and pressure ranges, and material compatibility have made this configuration the ideal solution for a wide range of applications.

Potential Applications

This valve configuration was developed to meet the difficult requirements associated with barrier valves used in space systems. Typically, a solenoid valve controls flow from a tank upstream of a satellite's propulsion system. They function in launch vehicles as piloting valves for isolating the pneumatics, whether it be in fuel, oxidizer, or helium purge systems. These valves have also been used for controlling thrust vector actuators. Aircraft systems may require barrier valves as well. Ordinance deployment often operates using tanks of compressed gas, and landing gear or braking systems may utilize pneumatic back-up systems.

Lee Solenoid Valves

The Lee Company offers the smallest solenoid valves available to the market. Lee Solenoid Valves have proven themselves with decades of use in demanding applications under harsh conditions ranging from the high temperatures and pressures of deep subsea oil wells to the cold and vacuum of outer space – places where superior reliability and consistent performance are absolute requirements. The Lee Company is committed to providing full professional service to our customers through a worldwide sales network of graduate engineers who are available to find solutions to the most challenging application needs. Contact a Lee Sales Engineer today.



THE LEE COMPANY

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