

A single seat diaphragm operated non return valve designed for use in Bi-Propellant systems to prevent back flow of propellant vapours from the propellant tanks.

The Non-Return valve is an all welded configuration employing titanium, titanium alloy, stainless steel and PTFE for the propellant wetted surfaces. The design is characterised by few components, no sliding parts and a low cracking pressure, pressure drop and internal leakage achieved by the pressure assisted, diaphragm type of flat seal concept.

The supply pressure acting against the spring loaded diaphragm piston lifts the sealing annulus from the mating PTFE seat permitting the flow of gaseous helium into the system pressurant lines. Continued flow, will at a certain time bring the system pressure up to the level at which the pressure differential across the diaphragm is insufficient to prevent the spring from re-seating the seal. The valve is then closed, stopping all flow of gas until a drop in the downstream pressure is detected by the diaphragm and the valve starts to 'crack' open allowing re-pressurisation.



### Performance Characteristics

Operating Media	GHe, NTO, MMH
Operational Temperature	-50°C to +50°C
Operating Pressure	Up to 35.6 bar
Cracking Pressure	< 0.20 bar
Re-seat Pressure	0.085 bar max. below cracking pressure
Pressure Drop	< 0.20 bar at 0.50 g/sec GHe
External Leakage	< 1 x 10 <sup>-6</sup> scc/sec GHe
Internal Leakage (reseat)	< 1 x 10 <sup>-4</sup> scc/sec GHe
Cycle Life	5,000 operational
Mass	< 85 g
Inlet Filtration	10 micron absolute
Materials	Titanium, Titanium alloy, Stainless steel, Teflon
Interfaces	1/4" weldable Ti tubing (optional 3/8")

### PRODUCT HISTORY

The single element Non Return valve was originally developed as part of the ESA Advanced Systems Technology Programme (ASTP-4) and qualified for the ARTEMIS Unified Propulsion System. This unit has since been selected for use on a number of major satellite programmes including Eurostar and Spacebus.

