



VN03 Non-Return Valve

Non-Return Valves are required to prevent back flow and mixture of fuel (MMH) and oxidizer (NTO) liquid or vapor from the propellant tanks to the helium pressurization system and between fuel and oxidizer tanks in a bipropellant system.

During normal operation of the pressurization system each valve opens at a predestined cracking pressure to allow gaseous Helium (GHe) flow to pressurize the respective propellant tanks.

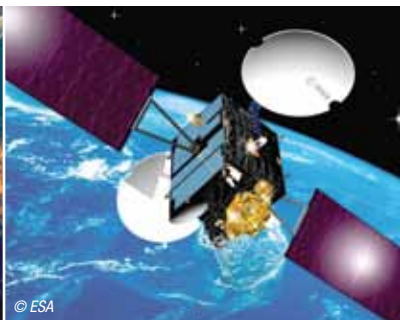
When the pressure differential in the nominal flow direction decays to a certain value, the valves close by virtue of a preloaded bias spring and thus prevents reverse flow when the pressure increases in the reverse direction.



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Performance Characteristics	
Operating Media	GN2 GHe, NTO, MMH, Hydrazine
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 1/4" Version	< 0.150bar at 0.24g/sec GH
External Leakage	< 1 x 10 ⁻⁶ scc/sec GHe
Internal Leakage	< 1 x 10 ⁻⁴ scc/sec GHe (with 10 bar reversed pressure applied)
Cycle Life	≥ 5,000 operational
Mass	< 90 g
Inlet Filtration	15 micron absolute
Materials	Titanium, Titanium alloy, Stainless steel, Teflon
Interfaces	1/4" weldable Ti tubing (optional 3/8")

Heritage

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.

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