

# Non-Return Valve

- Chemical propulsion system check valve



The **Non Return Valve (NRV)** is used to prevent the back flow and mixture of bi-propellant fuels in spacecraft propulsion systems. Chemical

propulsion systems need to show the flow of vapours from the propellant tanks to the helium pressurization system and between fuel and oxidiser tanks in a bi-propellant system.

During normal operation of the pressurisation system the valve opens at a predetermined cracking pressure to allow gaseous Helium (GHe) flow to

pressurise the respective propellant tanks. When the pressure differential across the valve in the normal flow direction reduces to a predetermined value the valve closes by the action of a preloaded spring thus preventing the reverse flow of gas or vapour when the pressure increases in the reverse flow direction.

Operating Media	GN <sub>2</sub> , GHe, NTO, MMH, N <sub>2</sub> H <sub>4</sub>
Maximum Operating Pressure	36 bar
Operating Temperature	-50°C to +50°C
Proof Pressure	72 bar
Burst Pressure	144 bar
Flow Rate / Pressure Drop	Flowrates up to 5g/s. <0.15mbar, with 0.24g/s GHe at 18 bar inlet
Internal Leakage	<1 x 10 <sup>-4</sup> scc/s GHe with 10 bar reverse pressure applied
External Leakage	<1 x 10 <sup>-6</sup> scc/s GHe
Cycle Life	>200,000 cycles
Inlet Filtration	15 µm absolute
Wetted Materials	Titanium Alloy, Stainless Steel, PTFE
Hardware Mass	<90 gram
Envelope (overall length)	126 mm including stub tubes
Options	High flow version available
Fluidic Interface	1/4" or 3/8" tube stub (weldable)
Technology Readiness Level	Flight Qualified, TRL9



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