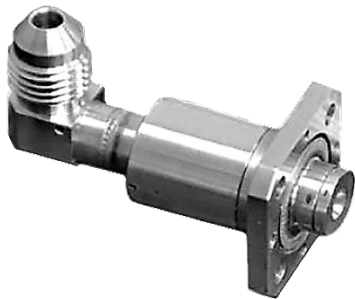


Spacecraft Cold Gas Thruster Valve

- 10mN to 100mN Thrust



Based on the well-established SVS01 range of high performance solenoid valves; the **SVT01** series of **Cold Gas Thrusters** has been in production for over fifteen years.

Across the range, the same solenoid body is used, with the variation in thrust being achieved with

an interchangeable nozzle cone at the outlet. This system allows the incorporation of a baffle which protects the elastomeric seal from atomic oxygen attack.

The mono-stable solenoid uses a single coil to energise the movement of a suspended sealing armature. This assembly is located using a diaphragm spring to eliminate sliding fit issues.

The armature to seat profiles have been designed to minimise flow discontinuities, thereby reducing the susceptibility to contamination induced failures. It also uses a flat faced seal to reduce the

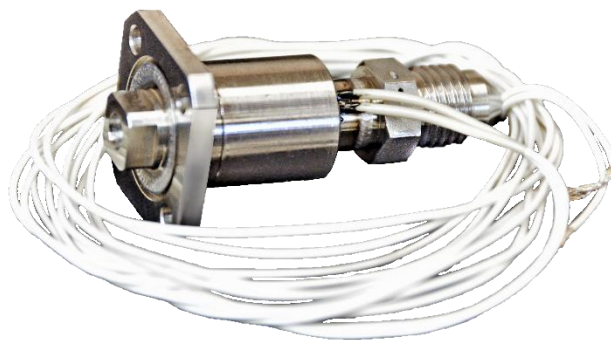
risk associated with valve internal leakage due to a high cycle life.

When in the unpowered state, system pressure forces and a spring, work together to keep the armature held in the closed position.

The coil resistance, inlet filter rating, seal material and mechanical interfaces are all adjustable to suit the customer requirements.

The thruster has flown on a variety of spacecraft, including:

- CryoSAT 1
- CryoSAT 2
- TanDEMx
- Swarm



The valve inlet can be in-line or right angled

Spacecraft Cold Gas Thruster Valve

- 10mN to 100mN Thrust

Operating Media	GN2, CF4, GXe
Maximum Operating Pressure	1 bar to 2.5 bar
Proof Pressure	17.5 bar
Operational Temperature	-35°C to +95°C
Vacuum Thrust	10mN ($\pm 5\%$) to 100mN ($\pm 5\%$)
ISP (Ambient Temperature)	GN2 -72s (nominal); CF4 -47s (nominal); GXe -30s (nominal)
Thrust Vector Accuracy	$<1^\circ$
Impulse Bit Repeatability	$<5\%$
Electrical Interface	Flying leads
Coil Resistance	110 Ω to 115 Ω at 20°C (typical)
Response Time	$<5.0\text{ms}$ (Opening and Closing)
Power Consumption	Coil and voltage dependent
Internal Leakage	1×10^{-4} scc/s GHe max at 1.5 bar
External Leakage	1×10^{-6} scc/s GHe max at 1.5 bar at EOL
Operating Cycle Life	1,500,000 cycles
Filter Rating	25 μm absolute
Construction Materials	AISI304L, Radiometal 4550, Silicone/EPDM Rubber
Hardware Mass	60 gram
Envelope	24x24mm flange, 16mm cylinder OD, 52mm length
Fluidic Interface	In-line or right angle threaded AS4395 fitting
Fluidic Interface option	Optional stub tube attachment
Structural Interface	Metallic Flange with M4 bolt holes [customisable]
Mounting	4 off M3 hole on 23mm PCD
Technology Readiness Level	Flight Qualified, TRL9



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