

Dual In-line Thruster Valve

- 2 stage, single coil chemical thruster valve



Nammo Space is developing the **Dual In-line Chemical Thruster Valve [SVS10]** together with ESA. It is a two stage solenoid actuated flow control device, designed for propulsion system applications.

The Chemical Thruster Valve consists of a pair of identical valve stages. The inlet and outlet fittings are different which creates the upstream and downstream valve. Each valve stage is a solenoid operated flow control valve with a single seat, single coil, normally closed with non-sliding fit configuration.

The design of the seal/seat interface ensures minimal flow discontinuities, therefore reducing susceptibility to contamination induced failures and minimising pressure losses.

Each valve is opened independently by energising each coil; the resulting force generated by the induced magnetic flux causing the armature

to move towards the 'fixed pole', and in doing so lifts the seal from its seat.

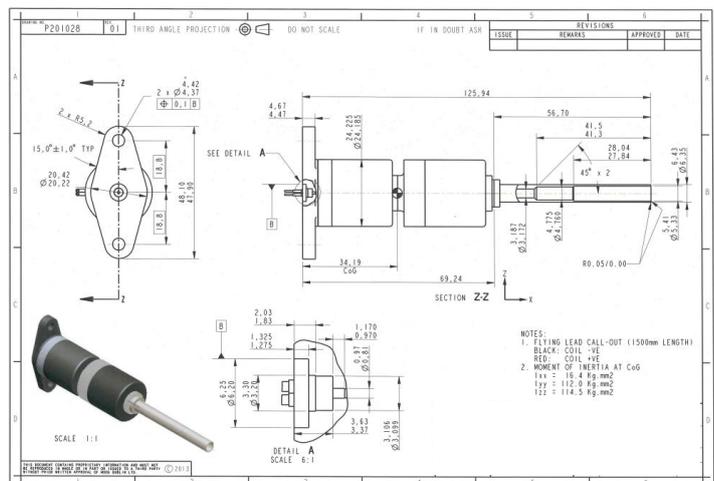
The thruster valve is a fully welded component, ensuring the external leak meets the spacecraft needs.

The inlet incorporates a 25µm particle filter, integrated in the valve inlet. The inlet to the valve can be supplied with welded or threaded connections, using straight and right angled connections.

The outlet flange incorporates the interface with the thruster or other equipment. This is typically a bolted flange interface, and can be customised depending on the customer application



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Engineering Model Hardware



Typical interface details for the Dual In-line Chemical Thruster Valve, which can be configured for the customer at both inlet and outlet.

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Typical Operating Media	MMH, MON, Hydrazine, IPA, GN ₂ , GHe, H ₂ O ₂
Max Expected Operating Pressure	25.4 bar
Maximum Expected Inlet Pressure	42 bar
Back Relief Pressure	Between 6.5 bar and 30 bar
Surge Pressure	42 bar for 0.2s
Proof Pressure	105 bar
Burst Pressure	185 bar
Flow Rate / Pressure Drop	< 0.5bar at 2g/s H ₂ O
Internal Leakage	1 x 10 ⁻⁵ scc/s GHe, tested at 1.5 MEOP
External Leakage	1 x 10 ⁻⁶ scc/s GHe, tested at 1.5 MEOP
Operating Temperatures	0°C to 100°C in qualification
Non-Operating Temperatures	-40°C to 100°C
Response	< 15ms open/close, at 24 Vdc under all conditions
Vibration	37.68 gRMS
Shock	2000g [1.5kHz -10kHz]
Electrical Interface	Flying leads
Operating Cycle Life	1,000,000 cycles
Filter Rating	25 µm absolute
Wetted Materials	AISI316L, AISI304L, AISI430, PTFE
Hardware Mass	210 grams, excluding flying leads
Envelope	126mm x 48.1mm x 24.3mm, with straight weld tube
Pull-in Voltage	22Vdc
Input Voltages	24Vdc to 38Vdc
Coil Power	Maximum 6.13Watts, per stage, at 28Vdc
Fluidic Interface	1/4" tube stub or threaded AS4395 fitting
Structural Interface	Metallic Flange with bolt holes [can be customised]
Technology Readiness Level	TRL5



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