

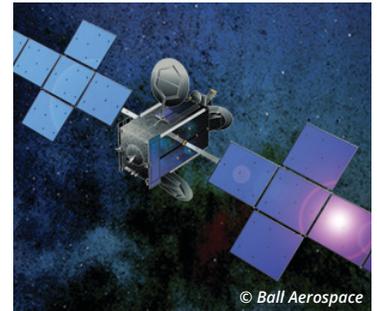
BIPROPELLANT TORQUE MOTOR THRUSTER VALVES



Moog Torque Motor thruster valves have been in production for almost four decades. T/M thruster valves were originally developed for the original Galileo spacecraft and for Minuteman II and III engines. The T/M thruster valve has a normally closed configuration. Redundant upstream valves can have a thruster or latch valve configuration.

KEY ADVANTAGES

- Precise control of both fuel and oxidizer
- Minimum dribble volume
- All welded design to prevent external leakage
- PTFE seal and stainless steel construction
- Normally closed valve state
- Microswitch or HED position indication available for latch valves



BIPROPELLANT TORQUE MOTOR THRUSTER VALVES

PERFORMANCE CHARACTERISTICS

2.5 lbf (10 N) Thrust

5 lbf (22 N) Thrust
Redundant Seat

15 lbf (66 N) Thrust
Redundant Seat

100 lbf (445 N) Thrust
Single Seat

Characteristic



Max Operating Pressure, MEOP [psia (bar)]	319 (22)	319 (22)	425 (29.3)	285 (197)
Proof Pressure [psia (bar)]	479 (33)	1102 (76)	750 (51.7)	552 (30.1)
Burst Pressure [psia (bar)]	1,276 (88)	1,870 (129)	2,000 (138)	1,500 (89)
Flow Coefficient (GPM water/(ΔP) ^{0.5})	0.00023	0.00042	0.0012	0.0060
Operating Voltage Range [Vdc]	25 to 43	25 to 43	24 to 33	21 to 35.5
Open Response Time [msec]	2.3 to 2.9	1.8 to 2.4	9 max	30 max
Close Response Time [msec]	2 max	2 max	4 max	30 max
Power Consumption [watts]	8.2 at 51.5 Vdc & 70F	8 at 43 Vdc & 70F	23 at 33 Vdc & 70F	19 at 35.5 Vdc & 70F
Leakage per Seat, Internal [scc/hr]	1.8	1	5	5
Leakage, External [scc/s]	1E-6	1E-6	1E-5	1E-4
Cycle Life [cycles]	1,000,000	1,000,000	100,000	10,000
Weight [lbm (gram)]	0.52 (235)	1.2 (550)	1.9 (860)	2.0 (910)
Inlet Filtration, [micron absolute rating]	40	40	50	35
Operating Temperature Range [°F (°C)]	32 to 140 (0 to 60)	14 to 302 (-10 to 150)	20 to 140 (-10 to 60)	50 to 122 (10 to 50)
Representative Model Numbers	-051-215A -051-131C	-051-338	52-189	53-177 53-163

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