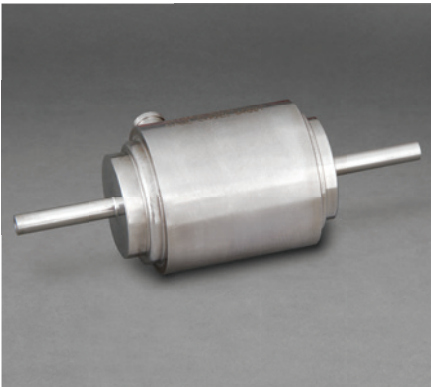


ELECTRIC PROPULSION

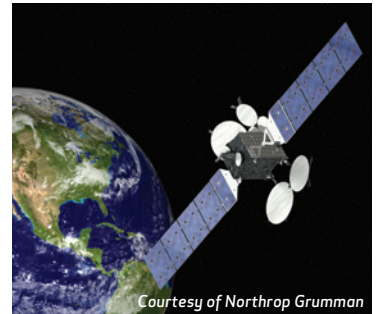
PROPORTIONAL FLOW CONTROL VALVE (PFCV)



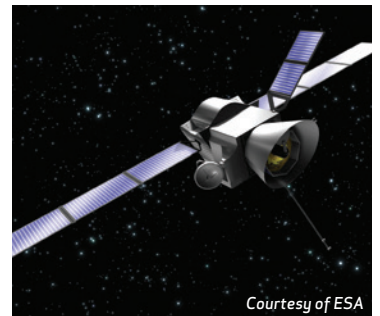
The 51E339 Proportional Flow Control Valve (PFCV) is an all welded, normally-closed, solenoid-type valve that can provide outlet flow control or pressure regulation in proportion to the input current, within its operating range. The PFCV can be operated directly in an open-loop control mode, or automatically in a closed-loop control mode with a downstream telemetry feedback to control the input current.



Courtesy of Lockheed Martin Corporation



Courtesy of Northrop Grumman



Courtesy of ESA

PROPORTIONAL FLOW CONTROL VALVE (PFCV)

SPECIFICATIONS

Parameter	Performance
Materials of Construction	Stainless Steel and Vespel
MEOP / Proof / Burst Pressure	186 / 279 / 465 bar (2700 / 4050 / 6750 psia)
Internal Leakage	$< 1 \times 10^{-4}$ sccs GHe over inlet pressure range
External Leakage	$< 1 \times 10^{-6}$ sccs GHe
Inlet Pressure Range in Regulation Mode	2.8 – 186 bar (40 – 2700 psia)
Outlet Pressure Range in Regulation Mode	2.28 – 2.55 bar (33 – 37 psia) over inlet pressure range and over 6 – 30 mg/s Xe flow range
Inlet Pressure Range in Flow Mode	2.8 -186 bar (40 - 2700 psia)
Outlet Pressure Range in Flow Mode	0 – 2.8 bar (0 – 40 psia) over inlet pressure range up to 200 mg/s Xe flow range
Flow Range	0 – 30 mg/s Xe typical, >200 mg/s Xenon maximum at 186 bar (2700 psia) inlet pressure
Input Current Range	0-140mA maximum sustained (full open) 75mA minimum opening
Throttle Rate	<25 ms
Response Time	<10 ms open or closed
Coil Resistance	74.5 ± 2 ohms at 21°C (70°F)
Flow Gain	<2.5 mg/s Xe per mA at 2.8 bar (40 psia) inlet
Filtration	25 microns absolute inlet
Shock	3000g / 5000 Hz in plane, 6000g / 5000 Hz out of plane
Random Vibration	19.2 grms in plane 24.7 grms out of plane
Thermal	-34 to 100°C (-30 to 212°F) operational -40 to 125°C (-40 to 257°F) non-operational
Life	1,000,000 cycles
Mass	115 g (0.25 lbm) max
Heritage	AEHF, BepiColombo, SGEO, TacSat-2, FalconSat-5, 6, GEOSat, Psyche



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