

Precision Proportional Flow Control Valve



*Low size, mass, power, sub-miniature PFCV
for precision propellant management and space applications*

Busek's 2 x 2 x 2.5cm miniature valves are the result of over 10 years of pioneering research and development, enabling new classes of CubeSat and NanoSat missions. These precision valves are next-generation versions of valves developed for the ST7 flight program.

The miniature valve has been designed to work with ionic liquids, but it is capable of precisely metering many other common propellants, including cold gas.

- Leak rate < $10e^{-5}$ mbar-L/s
- Components are designed to withstand > 500 PSI input pressure
- Design heritage from Lisa Pathfinder mission (delivered 2008)
- Low power: < 40mW
- Low mass and volume: 35 g and <10cc
- TRL 6



**Busek's Normally Closed
Proportional Flow Control Valve**

Busek Co. Inc specializes in providing complete electric space propulsion systems including but not limited to a wide range of thrusters, propellant management systems, power processing units and digital control interface units. Busek provides analytical, computational, experimental and product services to government and industry.

Precision PFCV

Technical Specifications

Electrical

Valve Power	40 mW
Input Voltage	0 to + 200 VDC

Mechanical

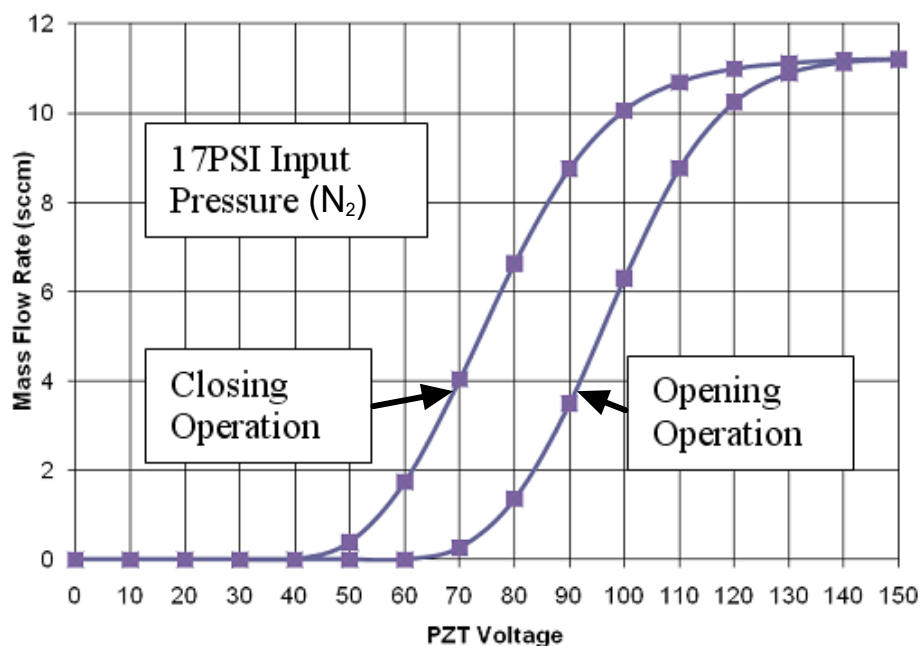
Valve Mass	35 g
Valve Dimensions	2.0 x 2.0 x 2.5 cm

Performance

Control Resolution	Measured 2.5 pL/s resolution ($\mu = 0.0175$ cP, $\Delta p = 15$ PSI), which translates to better than 0.005% resolution.
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Heritage	LISA Pathfinder Disturbance Reduction System (ST7-DRS), design heritage
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TRL	6
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Hysteresis is inherent to the piezo actuator and is repeatable.
Mass flow rate is calculated as a function of valve excitation and valve direction.