Palomar Micro Propulsion System

XS0E10220-01

SPACE

The Palomar Propulsion System is a fully integrated CubeSat micro propulsion system that includes a propellant tank, plenum and eight thrusters. The Palomar MiPS is designed to occupy the center of a 3U CubeSat. This smart system is designed to interface with the spacecraft through an I^2C data bus for command and control.

The Palomar MiPS is primarily a reaction control system with thrusters arranged so that use of all six degrees of freedom (DoF) in rotation and translation are possible. Additional propellant is available by stretching the tank lobes, allowing for a custom propulsion system mass and volume based on specific mission needs.

Upgrades to other propellants available.

Features

- Over 200,000 thruster firings in a simulated space environment
- Ten frictionless valves for thrust, plenum pressure regulation, and filling
- Eight independent thrusters
- Simple command protocol for operation and health monitoring
- Liquid isobutane propellant provides high storage density; other propellants available
- Complete propulsion system in one monolithic package
- 5V power supply and I^2C serial data interface

Operating Parameters

Max Operating Pressure	150 psia
Proof Pressure	225 psia
Burst Pressure	375 psia
Thrust	35 mN
Internal Leakage	3.0 scc/hr
External Leakage	1.0×10^{-6} scch
Operating Temperature	0°C to +50°C
Non-Operating Temperature	-10°C to +60°C
Vibration	23 Grms

Cycle Life	120,000 firings
Total Impulse	85 N/sec
Minimum Impulse Bit	0.75 mN/sec
Operating Voltage	4.75 to 5.25 vdc
Peak Power	<5 watts (two thrusters)
Dry Mass	890 grams
Propellant Mass	173 grams
Total Mass	1,063 grams

Performance characteristics are based on customer requirements. As such, they are not representative of component capabilities or limitations.

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Envelope Drawing

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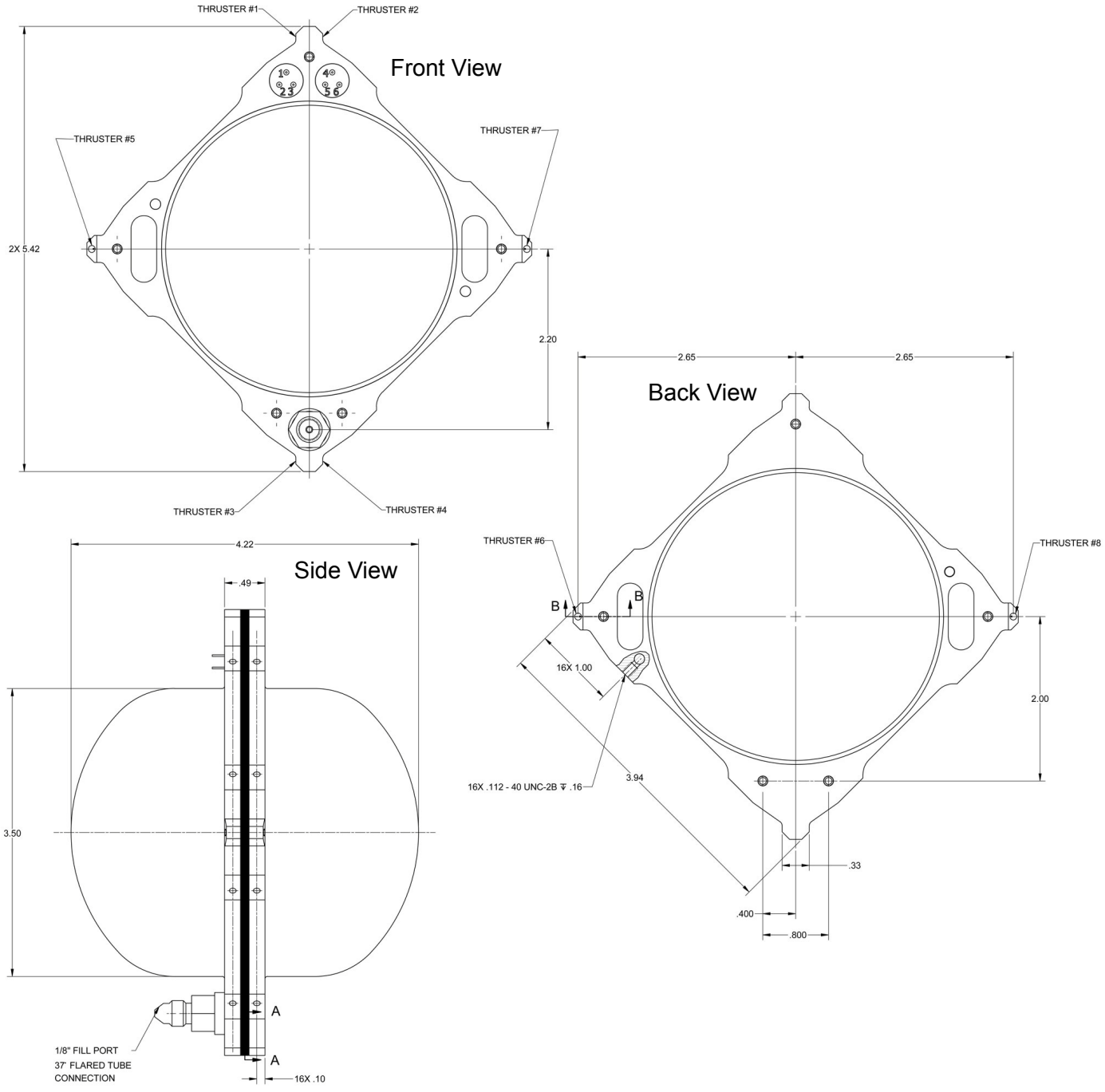
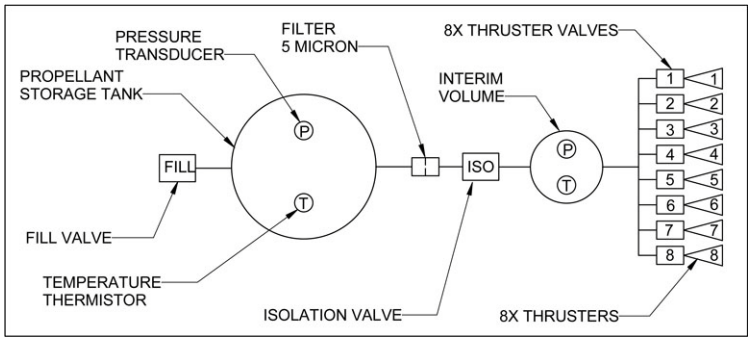


Flow Schematic



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