Lunar Flashlight Propulsion System

X16029000-01

SPACE

VACCO's green mono-propellant Micro Propulsion System (MiPS) provides a highly reliable solution for a fully self-contained CubeSat attitude control and main propulsion system. JPL's Lunar Flashlight program will use VACCO's MiPS configured for ADN green propellant to perform its Lunar surveying mission.

Performance density: 969 N-sec/L

The VACCO Lunar Flashlight MiPS is approximately 3U in volume and uses four 100 mN thrusters to develop 3,320 N-sec of total impulse that provides 237 m/s of delta-V for a 14 kg CubeSat. Each thruster independently operates to perform both delta-V and ACS maneuvers controlled by an integrated microprocessor controller.

Features

- Integral titanium fluid control manifold and low friction, space grade valves
- All welded tank construction contains 2 kg of propellant
- Integrated microcontroller and RS-422 interface enable high-level commands from the host spacecraft
- Low power with < 1 Watt for health and status monitoring
- Easily configured for different mono-propellants
  - ADN green (LMP-103S)
  - Air Force green (AF-M315E)
- Performance density: 969 N-sec/L

Operating Parameters

Propellant	LMP-103S (ADN)
MDP	29.1 Bar (422 psia)
Proof Pressure	43.6 Bar (633 psia)
Burst Pressure	58.2 Bar (844 psia)
Internal Leakage BOL	1.0 x 10-4 sccs GHe
Internal Leakage EOL	1.0 x10-3 sccs GHe
External Leakage	≤1.0 x 10-6 sccs GHe
Operating Temp	10°C to 40°C
Non-Operating Temp	-34°C to 60°C
Total Impulse @10°C	3,320 N-s
Dry Mass	3.0 kg Max
Wet Mass 95% Fill @ 10°C	5.0 kg Max
Operating Voltage For Telemetry	5±0.25 V_{DC}
Operating Voltage For Heaters & Valves	9.5-12.6 V_{DC}
Standby Power	10 W Max
Warmup Power	35 W Max
Thruster Operating Power (4 thrusters)	15 W Max
Data Interface	RS-422

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

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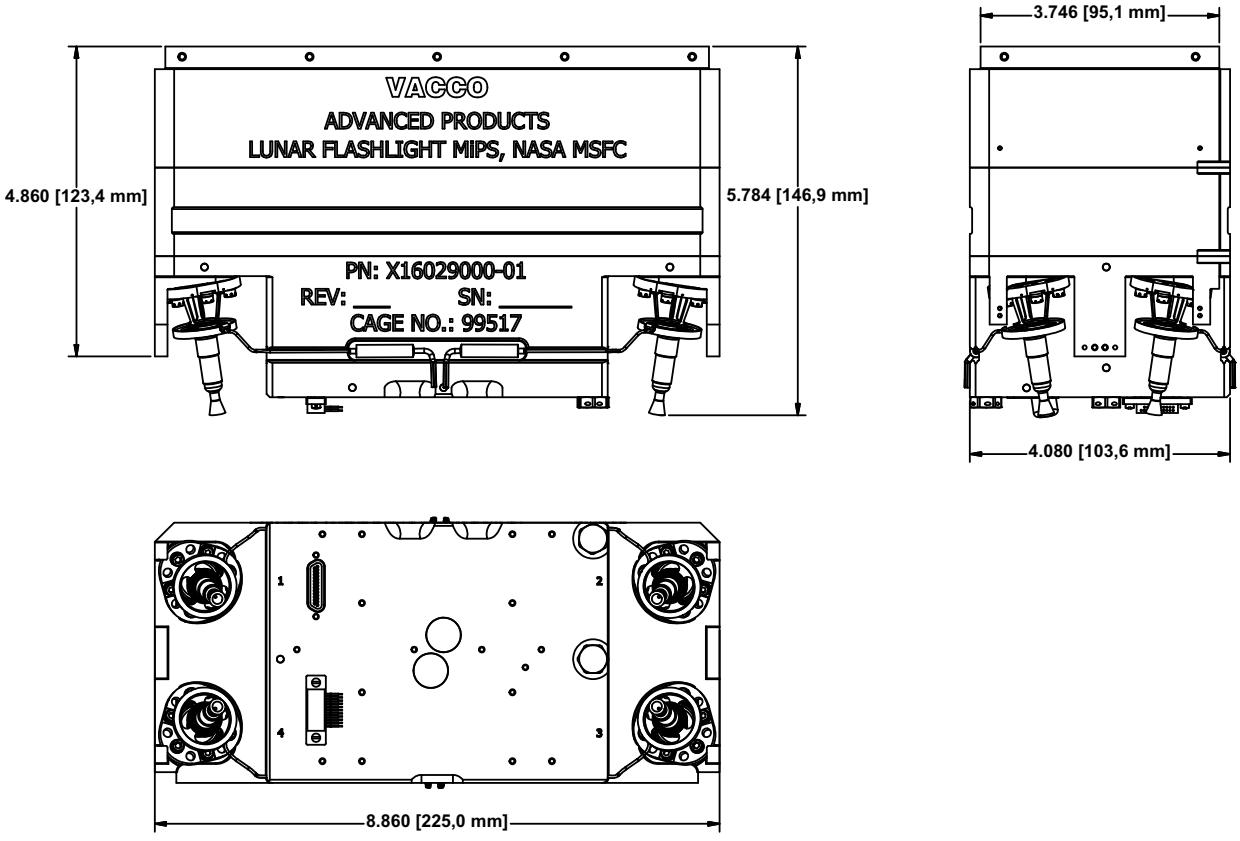
Envelope Drawing



Flow Schematic