End-Mounted Standard MiPS

The VACCO End-Mounted Standard Micro-Propulsion System (MiPS) is a low-cost, cold gas propulsion system designed to utilize the “tuna can” volume in CubeSat P-POD deployment systems.

Using Chemically Etched Micro System (ChEMS™) technology, VACCO has produced a complete propulsion system including propellant storage, pressurization, distribution, thrusters, and controller. This simple, highly integrated design uses a self-pressurizing liquid propellant that is expelled as a gas.

The 0.25U MiPS is capable of 93 N-Sec of total impulse with up to 1,860,000 firings, MiPS brings true propulsion capabilities to micro-spacecraft for formation flying, attitude control and velocity change (delta-v).

Features

- Five thrusters for pitch, yaw, roll and delta-v
- 10 mN thrust
- Up to 1,860,000 minimum impulse firings
- Frictionless valves
- Inherently safe, non-toxic R134a propellant
- All-welded aluminum alloy construction
- Light weight
- Minimal re-entry hazard
- Smart system with integral controller:
  - Simple RS422 digital interface
  - Integral sensor suite
  - Closed-loop vector pointing
  - Closed-loop thrust vector control

Operating Parameters

- Nominal Thrust................................. 10 mN @ 20°C
- Specific Impulse................................. 40 sec
- Total Impulse .................................. 93 to 312 N-sec
- Internal Leakage.............................. <1 x 10^{-3} sccs GHe
- External Leakage......................... <1 x 10^{-6} sccs GHe
- Operating Temperature...................... 0°C to +60°C
- Vibration............................................. 16 Grms
- Minimum Impulse Bit......................... 0.05 mN-sec
- Operating Voltage.............................. 9.0 to 12.6 vdc
- Mass (Including Propellant) ............ 676 to 1420 grams
- Stand-By Power................................. 0.25 watts
- Maximum Steady-State Power.............. 10 watts

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

<table>
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<tr>
<th>Part Number</th>
<th>Size</th>
<th>Depth (mm)</th>
<th>“Wet” Mass (grams)</th>
<th>Total Impulse (N-sec)</th>
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