

Standard Micro Propulsion System

The VACCO Standard Micro-Propulsion System (MiPS) is a low-cost, cold gas propulsion system designed for CubeSats.

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 0.3U MiPS is capable of 44 N-Sec of total impulse with up to 880,000 firings, MiPS brings true propulsion capabilities to micro-spacecraft for formation flying, attitude control and velocity change (delta-v).



SPACE

Features

- Five thrusters for pitch, yaw, roll and delta-v
- 10 mN thrust
- Up to 880,000 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

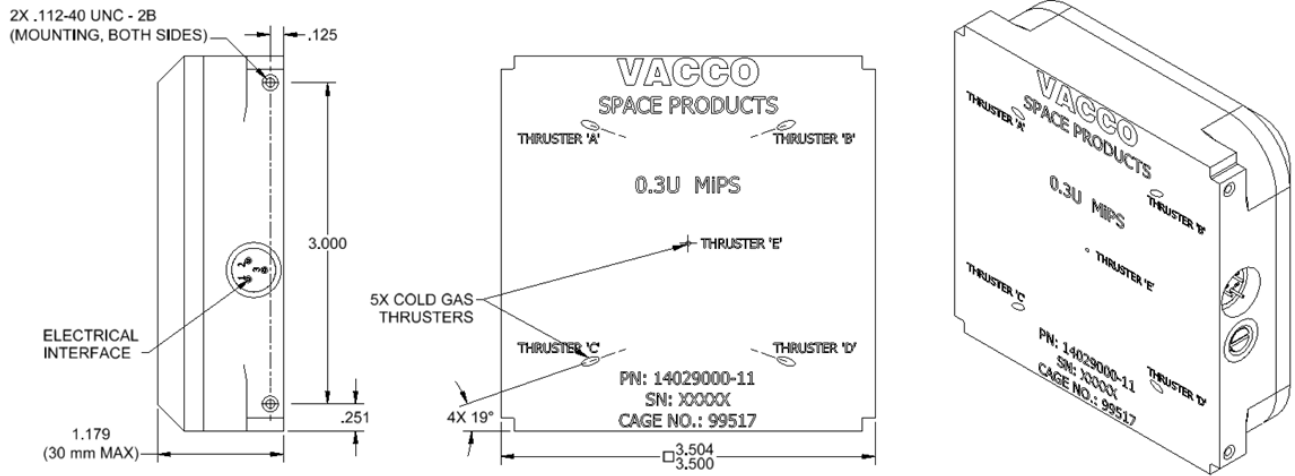
Operating Parameters

Nominal Thrust..... 10 mN @ 20°C
Specific Impulse..... 40 sec
Total Impulse 44 to 250 N-sec
Internal Leakage $<1 \times 10^3$ sccs GHe
External Leakage $<1 \times 10^{-6}$ sccs GHe
Operating Temperature..... 0°C to +60°C

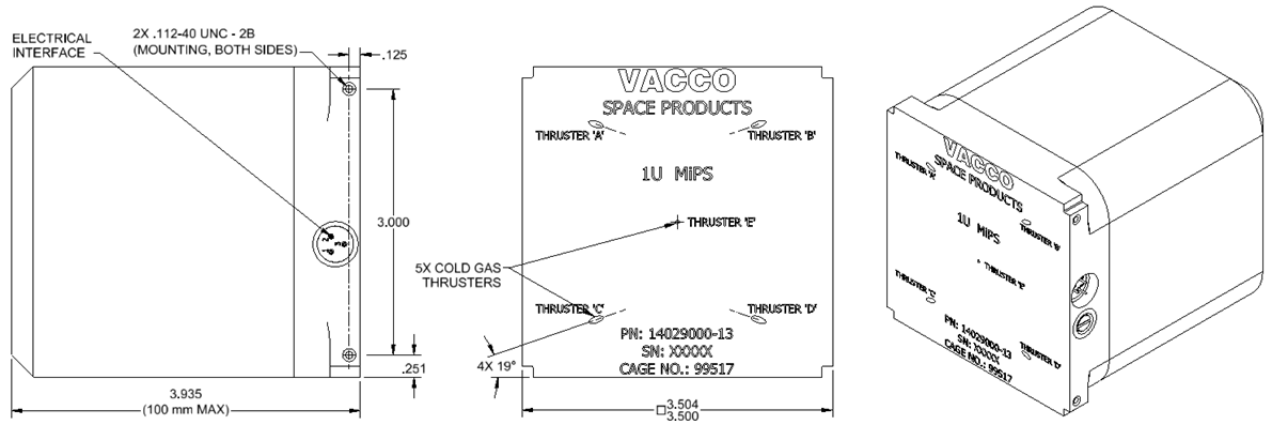
Vibration..... 16 Grms
Minimum Impulse Bit..... 0.05 mN-sec
Operating Voltage 9.0 to 12.6 vdc
Mass (Including Propellant) 542 grams (wet)
Stand-By Power 0.25 watts
Maximum Steady-State Power 10 watts

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

0.3U



1U



Spec List

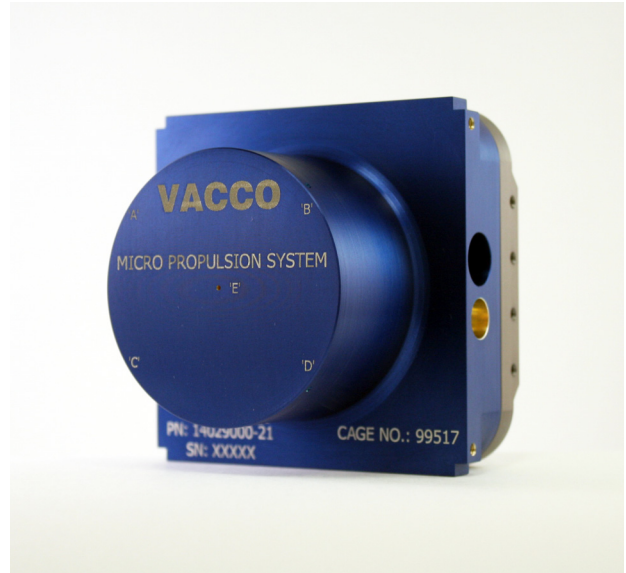
Part Number	Size	Depth (mm)	"Wet" Mass (grams)	Total Impulse (N-sec)
X14029003-1	0.3U	30	542	44
X14029003-4	0.5U	50	743	103
X14029003-7	0.8U	80	1044	191
X14029003-9	1U	100	1245	250

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).



SPACE

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

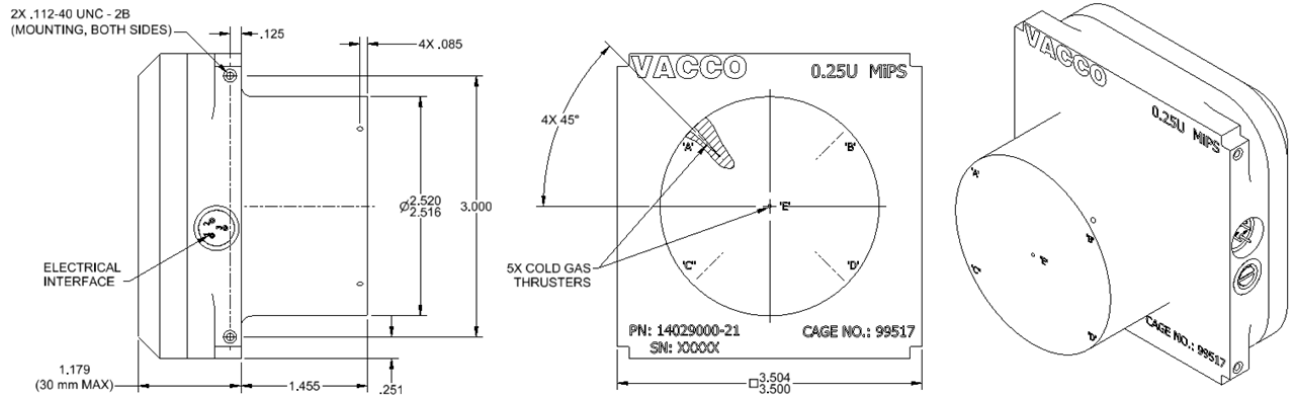
Operating Parameters

Nominal Thrust..... 10 mN @ 20°C
Specific Impulse..... 40 sec
Total Impulse 93 to 312 N-sec
Internal Leakage $<1 \times 10^{-3}$ sccs GHe
External Leakage $<1 \times 10^{-6}$ sccs GHe
Operating Temperature..... 0°C to +60°C

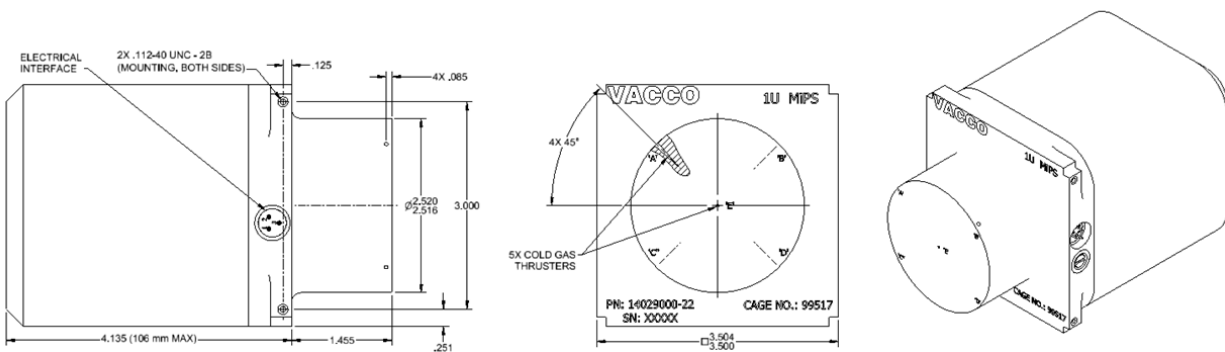
Vibration..... 16 Grms
Minimum Impulse Bit..... 0.05 mN-sec
Operating Voltage 9.0 to 12.6 vdc
Mass (Including Propellant) 676 to 1420 grams
Stand-By Power 0.25 watts
Maximum Steady-State Power 10 watts

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

0.25 U



1U



Spec List

Part Number	Size	Depth (mm)	"Wet" Mass (grams)	Total Impulse (N-sec)
X14029003-11	0.25U	30	676	93
X14029003-14	0.5U	56	924	166
X14029003-17	0.8U	86	1221	254
X14029003-19	1U	106	1420	312