Reaction Control Propulsion Module

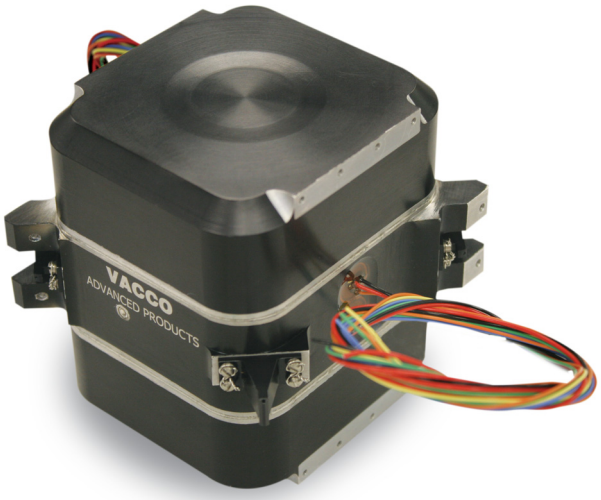
X13003000-01

SPACE

VACCO's Reaction Control Propulsion Module is a self-contained unit designed to occupy the center of a 3U CubeSat. A total of eight thrusters in groups of two at four corners of the module allows for precise rendezvous and proximity operations.

The Reaction Control Propulsion Module uses R236fa propellant, which self-pressurizes over the normal operating temperature range and helps to ensure range safety. This smart system is designed to interface with the spacecraft through an RS422 data bus for command and control.

The Reaction Control Propulsion Module can be scaled up or down from 0.8U based upon the mission and payload requirements.



Features

- **Inherently safe non-toxic R236fa propellant**
- **MDP ≃ 100 psia**
- **Two seals against leakage of propellant**
- **Eight fast response, low power 10 mN cold gas thrusters**
- **Smart system with integral electronic controller**
- **Aluminum construction**
  - Light weight
  - Ensures destruction during re-entry
- **Proportional heater and temperature sensors for precise control of propellant pressure**
- **Customizable thrust direction and magnitude**

Optional Features

- **Propellant purity sensor**
- **Radiation sensor**
- **Time stamp**
- **MEMS gyroscope**
- **Accelerometer**
- **Magnetometer**

Operating Parameters

Operating Temperature Range	-20°C to 60°C
Non-operating Temperature Range	-34°C to 60°C
Operating Voltage	9 to 12.6 vdc
Max Standby Power Consumption	0.25 watts
Max Power (2 Thrusters)	5 watts
Specific Impulse (ISP)	40 s
Total Impulse	174 N-sec
Nominal Continuous Thrust	10 mN +/- 2 mN
Minimal Impulse Bit	0.50 mN-sec
Thruster Valve Response	<10 mSec
Estimated Weight with Propellant	1,330 grams

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

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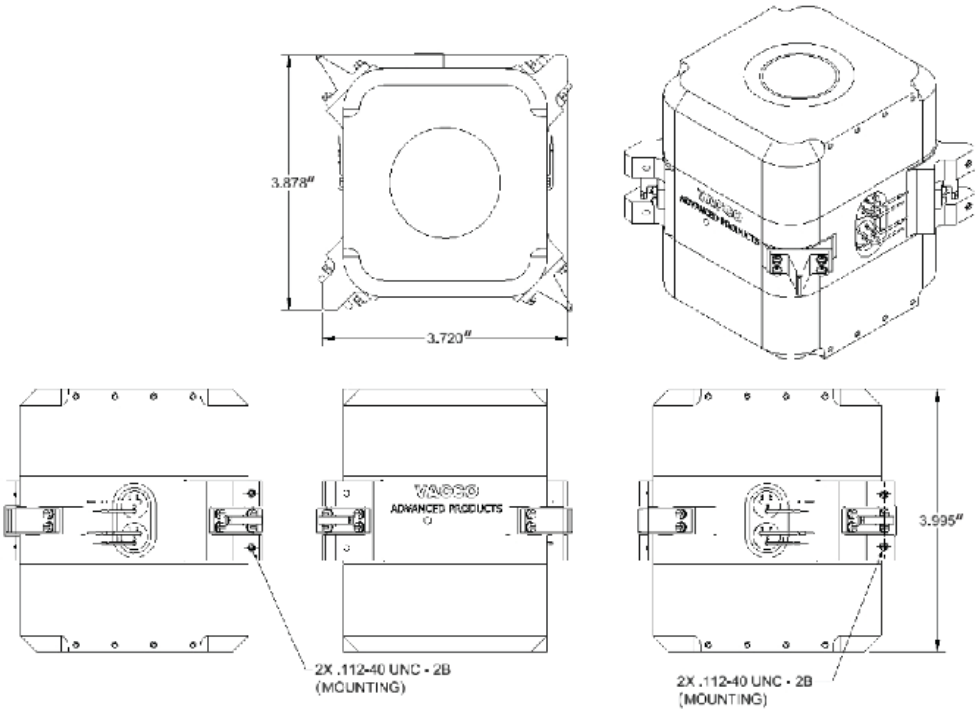
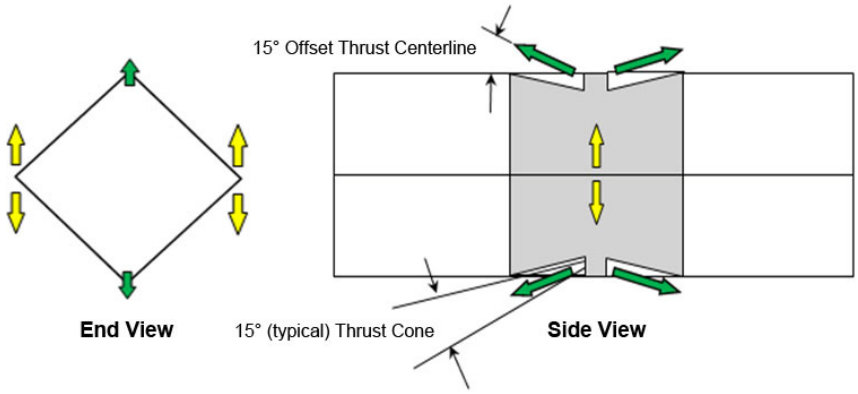
Envelope Drawing



Thruster Locations



Flow Schematic