

COLD GAS 1U CUBESAT PROPULSION MODULE

PUBLIC DATASHEET

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This document contains public information about the product.



About the Product

Building on years of green propellant research at DLR's Institute of Space Propulsion, ISPTech brings low cost, reliable, and high-performance propulsion systems to commercial and institutional markets.

The Cold Gas 1U CubeSat Propulsion Module provides a high impulse propulsion capability in small form factor. This 1U Module can be used CubeSats as small as 2U up to much larger configurations as its compact form factor allows it to be flexible incorporated into any CubeSat design. Furthermore, this cold gas propulsion system operates under 6.9 barD and thus is not classified as a pressure vessel, thus making the system safe, simple and effective.

This system provides a higher thrust capabilities with an insignificant power consumption as compared to an Electrical Propulsion system. Compared to a Hot Gas Propulsion system, it provides a more simple, reliable and safer propulsion system while still offering comparable performances. Thus, enabling your CubeSat to perform manoeuvres such as orbit raising and de-orbitation without imposing significant constraints on your system.

This CubeSat module can deliver more than 390 Ns impulse or over 87 m/s deltaV for a 5 kg 3U CubeSat, 41.4 m/s deltaV for a 10 kg 6U CubeSat, and 20.2 m/s deltaV for a 20 kg 12U CubeSat. All of this with a simple and reliable cold gas propulsion system with no pressure vessel and minimal active components while also being compliant with all launch and safety regulation.

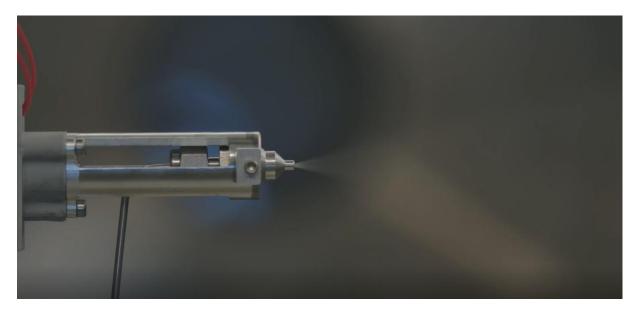


Figure 1: Cold gas thruster during testing



Your Advantages

- The propulsion system uses a propellant that is non-flammable, non-toxic, high-density, chemically stable, self-pressurising, and has a low freezing point
- A simple self-pressurising system with less active components and thus fewer possible points of failure
- Avoids pressure vessel regulations
- Insignificant power consumption
- Pulse mode operation allows for precise actuation
- ITAR free and REACH compliant
- No preheating or conditioning required

Status

In development with in-orbit demonstration scheduled for Q2 2026.

Cold Gas 1U CubeSat Module

Specifications

Specification	Value	Comment
Dimensions	X: 100 mm Y: 100 mm	Compatible to 2-24U CubeSats.
	Z: 113.5 mm	z-length customizable on request.
Cold Gas Thruster	1x 3 mN Thruster	At nominal condition at 25 °C.
	ISP ~ 43 s	(Operating temperatures and thus
		thrust can be increased with
		optional heaters)
Total Impulse	> 390 Ns	Can be available with different tank
		sizes.
DeltaV		Assumed Satellite Wet Mass:
	> 87 m/s	5 kg for a 3U CubeSat
	> 41.4 m/s	10 kg for a 6U CubeSat
	> 20.2 m/s	20 kg for a 12U CubeSat
Supply Voltage	10-32 VDC	customizable on request
Survivability Temperature Range	-34°C to +71°C	maximum
Operating Temperature Range	-24°C to +71°C	customizable
Wet Mass	up to 1.7 kg	-



Temperature dependence of Thrust

The plot below shows the temperature dependence of Thrust with the saturated propellant temperature.

