



Neumann Drive 50W

Metal Propulsion for Your Mission Needs

The ND-50 is a safe, efficient, and easy-to-use solution for Cubesats and SmallSats requiring electric propulsion capability. The ND-50 is well-equipped to handle your mission needs with capabilities such as orbit raising, station-keeping, formation flying, and, importantly, de-orbiting all existing within its operational envelope.

The ND-50 efficiently turns a solid metallic fuel rod into Δv for your spacecraft. Designed for simplicity, the system is fully contained and easy to integrate. Aiming to be a plug-and-play solution, the ND-50 offers both CAN and RS422-based communications with a simple command interface.

Technical Specifications

The ND-50's pulsed nature allows complete user control over where and when momentum is imparted to the spacecraft. The user can choose how many pulses are completed by the unit and the frequency at which these pulses are completed (up to the maximum). The system flexibility allows simple power budget management by the spacecraft operator since firing at a lower frequency will reduce the average power drawn by the ND-50. A benefit of the ND-50 is that the I_{sp} remains constant no matter the firing frequency.

Mechanical

Dimensions	L:96mm x W:96mm x H:100mm
Mass (Fuelled)	1365g

Propulsive

Specific Impulse	1800-2000s
Total Impulse	1500 Ns*
Impulse Bit	270 μ Ns
Maximum Pulse Rate	0.33 Hz

Interface

Communication Protocols	CAN, RS422
Supply Voltage Nominal	28 V*
Supply Voltage Range	26 V – 33 V*
Power Draw (Average, firing at max rate)	43 W
Peak Power	53 W
Power Draw (Idle)	1.8 W

*Can be customised to meet mission needs

Key Benefits

ΔV on demand



The ND-50 is ready to go when you are! From power-on, the system can pulse within seconds; no warmup time or attitude restrictions apply. Rapid operational readiness increases responsiveness and allows your operators to focus on other critical aspects of the mission.

High Isp, High Density



The ND-50's solid metal propellant achieves greater fuel density than equivalent gas or liquid-fuelled systems. When combined with the high Isp of our technology, the ND-50 offers a highly fuel-efficient solution in a compact form factor.

Safe



The design of the fully fuelled ND-50 makes it safe to handle at any point in the test and integration chain. The enclosed design prevents contact with sensitive electronics, and there are no toxic chemicals or substances in the system.

Heritage

The ND-50 builds upon the results from earlier in-orbit demonstration systems which flew on two Australian satellites in June 2023 (Skykraft) and December 2023 (Inovor Technologies), achieving mission success.

The ND-50 is currently manifested on several launches, both Cubesat and Smallsat, with first flights in 2024.

Simple Logistics and Integration



A system integrator's dream, the ND-50 is ITAR free, has a single electrical interface for power and communications, can be mounted on any of its six faces, and is shipped fully fuelled. Additionally, the ND-50 can be integrated and stored indefinitely without fuel management considerations.

Benign Exhaust



A unique characteristic of the ND-50 is its quasi-neutral exhaust, meaning that it does not require a neutraliser. This, along with its narrow exhaust plume minimises common risks associated with neutraliser complexity and spacecraft charging.

In-Built Failure Detection Isolation & Recovery (FDIR)



An important reassurance for your operators, the ND-50 has an integrated FDIR capability to address any anomalies identified by its health monitoring system. This reduces operational burden and enhances the ND-50's resilience against unexpected environmental events or operational errors.

