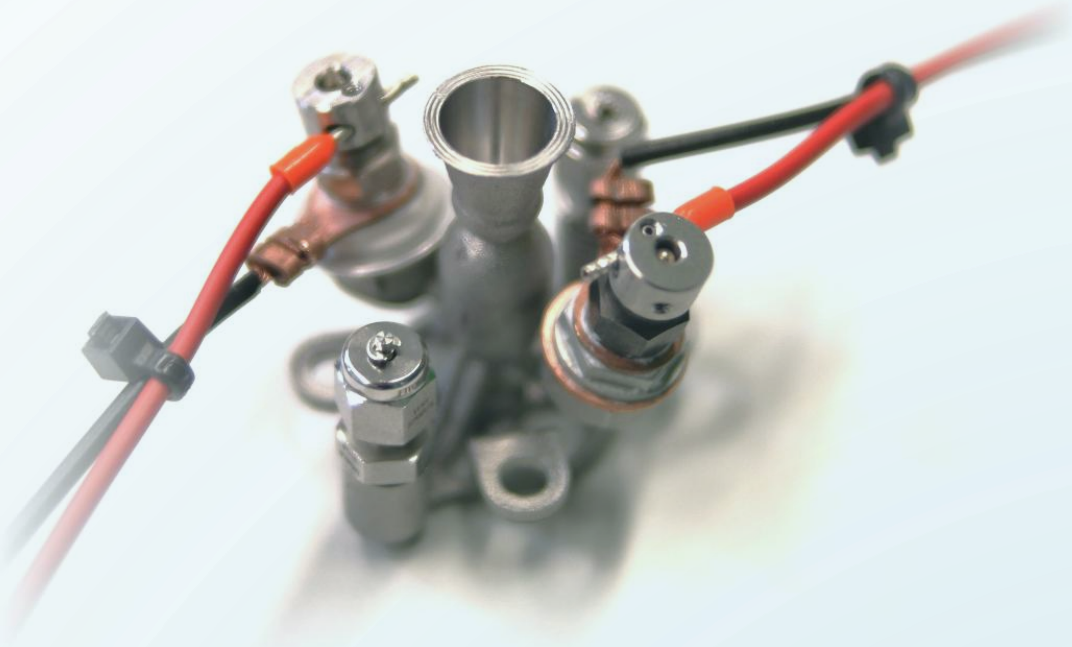
PUBLIC



HYNOX-1 Thruster

Public Datasheet

This document contains public information about the product.
For detailed information, please request the extended datasheet: contact@ISPTech.space

Version: DATASHEET-HYNOX-1-P04
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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 to commercial and institutional markets.

HYNOX-1 is a thruster in the **1 N** (0.22 lbf) thrust range using nitrous oxide (**N_2O**) and ethane (**C_2H_6**). An optimized injector and cooling design allows for **thermal steady-state operation** of the thruster and reproducible, high performance over a wide range of operating conditions. HYNOX-1 also operates in pulse mode.

Most importantly, HYNOX-1 can be adjusted and optimized for every mission. This includes the thrust level at a given temperature environment, interfaces and operating mixture ratio. The design and functionality were demonstrated in thousands of test firings.

Figure 1: HyNOx-1 during steady-state operation

Your Advantages

- Green, affordable and easily available propellants: N_2O + C_2H_6
- Designed for self-pressurized systems
- Thrust level can be controlled by propellant temperature
- Thermal steady-state operation allows for long operation time
- Pulse mode operation allows for precise attitude control
- Thruster operatable in cold gas mode
- ITAR free and REACH compliant
- Cold-start capable

Customized for Your Mission

- Adjustment of nominal thrust at given inlet conditions
- Adjustment of nominal mixture ratio (ROF) at given inlet conditions
- Adjustment of fluid connection and interfaces
- Health-monitoring instrumentation available

Specifications

Demonstrated Performance

Demonstrated values can be extended / increased when required by customer.

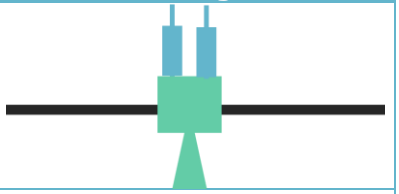
Specification	Value	Comment
Nominal thrust	1.0 N	demonstrated in vacuum
Thrust range	2.0 – 0.5 N	demonstrated in vacuum
Specific impulse	up to 270 s	demonstrated in vacuum
Single pulse firing time	16 minutes	demonstrated in vacuum
Propellant throughput with one thruster	3.5 kg	demonstrated in vacuum
Cumulated on-time with one thruster	100 min	demonstrated in vacuum
Pulses in a single pulse train	1 000	demonstrated in vacuum
Ignitions with one thruster	> 13 000	demonstrated in vacuum
Impulse Bit (hot gas)	10 mNs	demonstrated in vacuum
Impulse Bit (cold gas)	< 5 mNs	demonstrated in vacuum

Specifications

Specification	Value
Mass of thrust chamber w/o flow control valves	< 60 g, depends on configuration
Ignition	2 glow plugs (cold redundancy), **3.4 W**
Health Monitoring Instrumentation	thermocouples and chamber pressure sensor available on request
Flow Control and Fluid Connection Option 1: For Minimum Impulse Bit	2x solenoid valves, single seat each **6 W hit**, **0.25 W hold** 2x 1/16” tubing, adjustable
Flow Control and Fluid Connection Option 2: Higher Opening Pressure	2x solenoid valves, single seat each **W hit**, **0.3 W hold** 2x 1/16” tubing

Interfaces and Dimensions

The HYNOX-1 Thruster is available in a range of different mounting options:

Plate Mounting	Cut-out Mounting	In-line Mounting
		
Flow Control Valves need to be placed close to the thruster	Flow Control Valves need to be placed close to the thruster	Flow Control Valves are directly mounted to thruster
Feed lines outside the spacecraft	Feed lines inside the spacecraft	Feed lines inside the spacecraft

For detailed information, please request the extended datasheet. Drawings and CAD files are available on request.