1N Hydrazine Thruster

1N Monopropellant Hydrazine Thruster

For precision attitude, trajectory and orbit control of small and medium size satellites and spacecraft.

1N Hydrazine Thruster

General Description

The 1N monopropellant hydrazine thruster is used for attitude, trajectory and orbit control of small and mid-size satellites and spacecraft.

The thruster is typically used in our own propulsion systems and is also available separately for use in our customers' propulsion systems. More than 500 units of this thruster operate successfully in space.

The 1N thruster was derived from the space proven 0.5N thruster, of which some 165 units were flown on OTS-2, ECS, Marecs, Telecom-1, Skynet 4 and NATO-IV. Since these applications, the thruster has undergone multiple refinements, especially in achieving a minimum possible production cost. Today, this unit may be regarded as a low cost thruster

Propellant supply to the thruster is provided by a two stage flow control valve comprising two identical monostable, normally closed valves placed in series within a single housing.

Additionally each thruster is equipped with an internal redundant catalyst bed heater and with thermal insulation to guarantee optimum start up. All materials used in the valve and thrust chamber assembly have been selected for compatibility with hydrazine propellant.

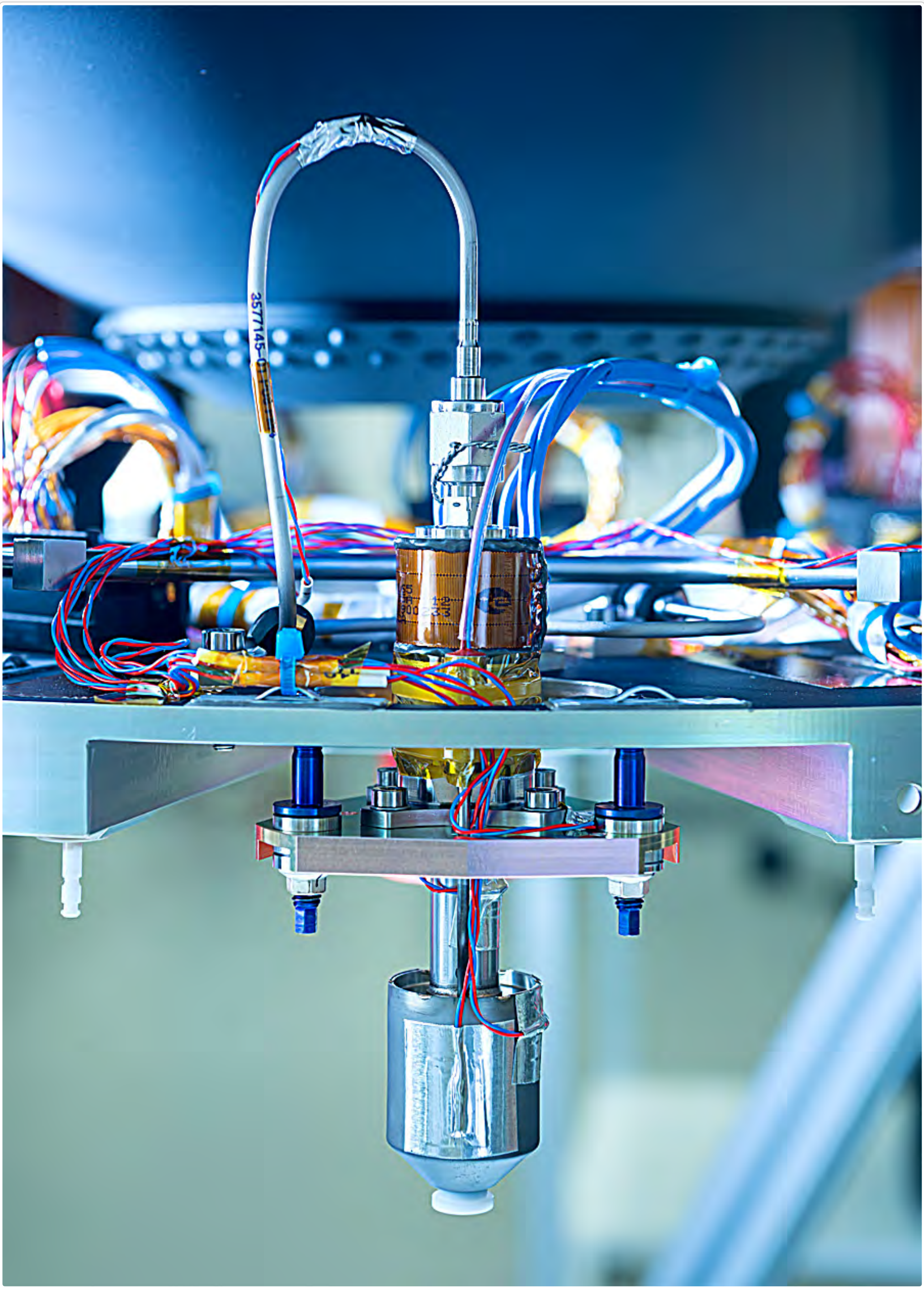
Thrust is generated when the control valve is commanded to open causing propellant to be fed to the thrust chamber where a decomposition reaction takes place within the catalyst bed.

The thruster is also designed to serve as a heat barrier for protecting the flow control valve and the spacecraft structure from improper high temperatures. In addition, the thruster is qualified for multiple cold starts.

Thruster Dimensions and Interfaces

Thruster dimensions and interfaces drawings can be found from the links below:

Elevation
Plan
Cut-Out



Integrated 1N Hydrazine Thruster

1N Monopropellant Thruster Characteristics

Characteristics	Values
Thrust, Nominal	1N
Thrust Range	0.320 - 1.1N
Specific Impulse, Nominal	220 s
Specific Impulse, Range	200 - 223 s
Mass Flow Rate, Nominal	0.44 g/s
Mass Flow Rate, Range	0.142 - 0.447 g/s
Inlet Pressure Range	5.5 - 22 bar
Minimum Impulse Bit	0.01 - 0.043 N
Nozzle Expansion Ratio (by area)	80
Mass Thruster with Valve	290 g
Propellant	Hydrazine (N2H4), High Purity Grade

Characteristics	Values
Total Impulse	135,000 Ns
Cycle Life	59,000 cycles
Propellant Throughput	67 kg
Single Burn Life	12 hours
Accumulated Burn Life	50 hours
No of Cold Starts < 10° C	10

HERITAGE - 1N Hydrazine Thrusters

Spacecraft	Launch
Globalstar	1997 -2000
Jason 1 (Proteus)	2001
Rocsat - 2	2004
Cosmo - Skymed 1	2005
Galileo GSTB	2006
Corot (Proteus)	2006
Calipso (Proteus)	2006
Cosmo - Skymed 2	2006
TerraSAR - X	2007
Radarsat - 2	2007
Cosmo - Skymed 3	2007
Jason 2 (Proteus)	2008
Theos	2008
Herschel Planck	2009
SMOS (Proteus)	2009

Spacecraft	Launch
Alsat 2A	2010
Alsat 2B	2010
Cosmo - Skymed 4	2010
Elisa - 1	2011
Elisa - 2	2011
Elisa - 3	2011
Elisa - 4	2011
Pleiades HR1	2011
SSOT	2011
AstroTerra 1	2012
Pleiades HR2	2012
Jason 3	2013
Vietnam - 1	2013
AstroTerra 2	2014
KRS	2014

Spacecraft	Launch
Perusat-1	2017
Merlin	2018
MN-35-1	2017
SEOSAR (paz)	2018
SEOSAT (Ingenio)	2018
Taranis	2018
Sentinel 2B	2017
Sentinel 5P	2018
CSO - 1	2018
CSO - 2	*
CSO - 3	*

Tandem-X	2010	Sentinal 2A	2015		

Hydrazine Thrusters
(PDF Brochure)

Hydrazine Thruster Brochure (pdf)

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