Surrey Microsatellite Gas Propulsion System

Surrey's microsatellite Propulsion System is designed as an in-orbit micropropulsion system test-bed. The first application is ESA's PROBA2 spacecraft. The core design of the system is based around heritage design of Surrey's benchmark Microsatellite xenon propulsion system technology. The design of the PROBA 2 system is optimized to constitute a platform to incorporate the following demonstration units and thus exhibit an application of their use:

COGEX: Four cool gas generators. These have the capability to re-fill the tank with a certain amount of gaseous nitrogen (>99% pure) at near ambient temperature.

The nitrogen is generated from a Sodium Azide based solid charge which generates the nitrogen when pyrotechnically initiated on demand.

FSD – one fibre optic pressure and temperature sensor.

Features:

- Completely ITAR free
- Gaseous propellants are used to avoid any liquid sloshing effects
- Propellant is stored in a 2.1 liter propellant tank, of titanium construction. The tank has a maximum expected operation pressure of 44 bar, with a burst factor of > x10
- The propulsion system is built as a module with integrated thruster. The thruster alignment can be modified at both module and spacecraft levels
- Bang-bang pressure regulation control allows thrust level to be throttled between 10 to 50 mN
- Surrey's flight proven resistojet thruster with either 15, 30 or 50 Watt redundant heaters
- Series solenoid valves to isolate the propellant stored in the tank
- Can be supplied with Integrated electronic controller with interface to CAN bus. Could be modified to RS485 if required

Other Surrey Products

- **Propulsion systems**: Flight proven systems using nitrogen, nitrous oxide, butane, xenon and water propellants, impulses ranging from 1 N.sec to 52 kN.sec
- **Propulsion products**: Resistojet thrusters, Mechanical and Electrical Ground Support Equipment, Design and test services
- **Subsystems** for C&DH, Power, Comms, ADCS and ODCS subsystems, various Payloads and ground segments
- **Space missions**: From platform provision to turn-key commercial and science space missions from LEO to GEO, in the 5 to 1,000 kg range
- **Know-how transfer** programs, including academic and industrial training of entire teams in real mission environments
- **Space Consultancy** for Insurance, Investment and Industrial sectors

Surrey is Changing the Economics of Space

SURREY SATELLITE TECHNOLOGY US LLC

Applications

- Launcher injection correction
- Constellations station keeping and acquisition
- Orbit height maintenance

Specifications

- Propellant:
  - 500g Xenon
  - 176g Nitrogen
- Thrust: 20 – 50 mN
- Storage Pressure: 40bar abs maximum @ 20°C
- Specific Impulse:
  - 42 sec Xenon @ 300ºC
  - 100 sec N2 @ 300ºC
- Total impulse: 380 N.sec
- System Volume: 2.1 liters
- Life duration: > 3 years

Environmental

- Operating temp.: -20°C to 60 °C
- Vibration > 13.1 grms (ll axes)

Power Supply

- Operating voltage: 28 Vdc nominal (24 – 38 Vdc)
- Valve power: 19 Watts open, 0.6 Watts hold
- Thruster : 2 x 15 Watt heaters (30 & 50 W optional)

Physical Characteristics

- Dry mass: 6.72 kg
- Dimensions: 400x 254 x 215 mm (ht)

Contact

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