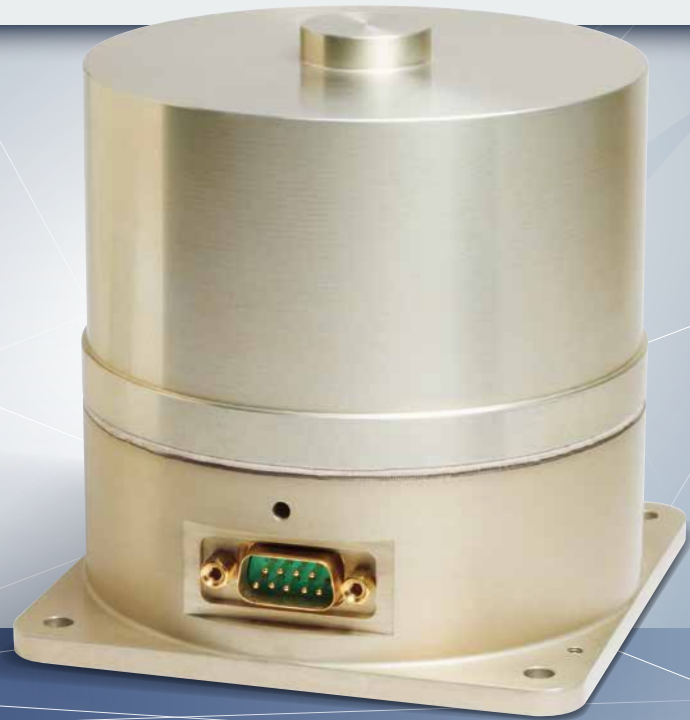


REACTION WHEEL



PERFORMANCE

| | NRWA-T065 | NRWA-T2 | NRWA-T6 |
|--------------------------------------|---|---|--|
| FUNCTIONAL CHARACTERISTICS | | | |
| Max wheel torque | 20 mNm | 90 mNm | 110 mNm |
| Max wheel momentum | 0.65 Nms (at 6500 rpm and 20 mNm) 0.94 Nms (at 3000 rpm) | 1.40 Nms (at 2600 rpm and 90 mNm) 1.62 Nms (at 3000 rpm) | 5.20 Nms (at 2400 rpm and 110 mNm) 5.45 Nms (at 2500 rpm) |
| Speed range | ±9000 rpm | ±3000 rpm | ±2500 rpm |
| Rotor moment of inertia | 1.0 x 10 ⁻³ kg.m ² | 5.1 x 10 ⁻³ kg.m ² | 21 x 10 ⁻³ kg.m ² |
| Speed control accuracy | <1 rpm @ >100 rpm | <1 rpm @ >100 rpm | <1 rpm @ >100 rpm |
| PHYSICAL CHARACTERISTICS | | | |
| Dimensions (wheel) | 102 mm x 102 mm x 105 mm | 150 mm x 150 mm x 75 mm | 250 mm x 250 mm x 90 mm |
| Dimensions (electronics) | Internal | Internal | Internal |
| Mass | 1.55 kg | 2.4 kg | 4.6 kg |
| Power | 40 mA / mNm | 13 mA / mNm | 8.7 mA / mNm |
| ENVIRONMENTAL CHARACTERISTICS | | | |
| Thermal (acceptance) | -5 °C to +40 °C | -20°C to +60°C | -20°C to +60°C |
| Mechanical Tests (qualification) | 16.95g _{RMS} (random) | 14grms (random) | 14grms (random) |
| Radiation (TID) (qualification) | 10 krad (component level) | 10 krad (component level) | 10 krad (component level) |
| INTERFACES | | | |
| Power supply | 28 V unregulated | 28 V unregulated | 28 V unregulated |
| Data | RS-422 | RS-422 | RS-422 |
| Connector | 9-pin D-type Male | 9-pin D-type Male | 9-pin D-type Male |
| Mechanical | 4off M5 | 4off M5 | 4off M5 |

ACCEPTANCE TESTING: All FM parts undergo random vibration (10 rms) as well as thermal cycling (four cycle ambient pressure) to five degrees beyond operational thermal specifications. However, NewSpace can perform additional environmental testing if required by a client.

CONFIGURATION MANAGEMENT: Specifications are subject to change. Please refer to latest version.

REACTION WHEEL



FEATURES

- Wheel torque and momentum capacity suited to client mission requirements
- Current, speed and Torque control
- Simple digital interface to spacecraft bus
- Integration with an optional gyroscope for inertial rate control and inertial angle control modes possible
- Hermetically sealed
- Long demonstrated lifetimes

APPLICATIONS

- High performance three-axis torque and momentum exchange actuators for agile small satellite missions
- Momentum bias
- Inertial rate control for accurate pointing of imagers

QUALIFICATION

The latest generation, the NRWA-T065, is TRL 9 and has extensive in-orbit heritage. Flying since 2014, this wheel has more than 3 million failure-free hours in-orbit with no reported SEU's. Given the robust nature of the T065 wheel, this product has become a preferred choice for longer lifetime missions and constellation programmes.

UTILITY

A high performance alternative to propulsion based reaction control system, reaction wheels provide spacecraft with control torque by means of momentum exchange between the satellite body and the rotating wheel. The increasing popularity of these wheels coupled with our commitment to high quality, fit-for-purpose components has resulted in NewSpace (NSS) offering these wheels in a range of sizes (NRWA-T005, NRWA-T065 and NRWA-T2).

Typically, three to four reaction wheels are needed to provide full three-axis control of a spacecraft. The additional integration of these wheels with external gyroscopes enables full three-axis control using inertial rates. With high torque stability, wheel momentum capacity and accurate speed control; the NSS reaction wheels are ideal for agile small satellite missions requiring accurate pointing.