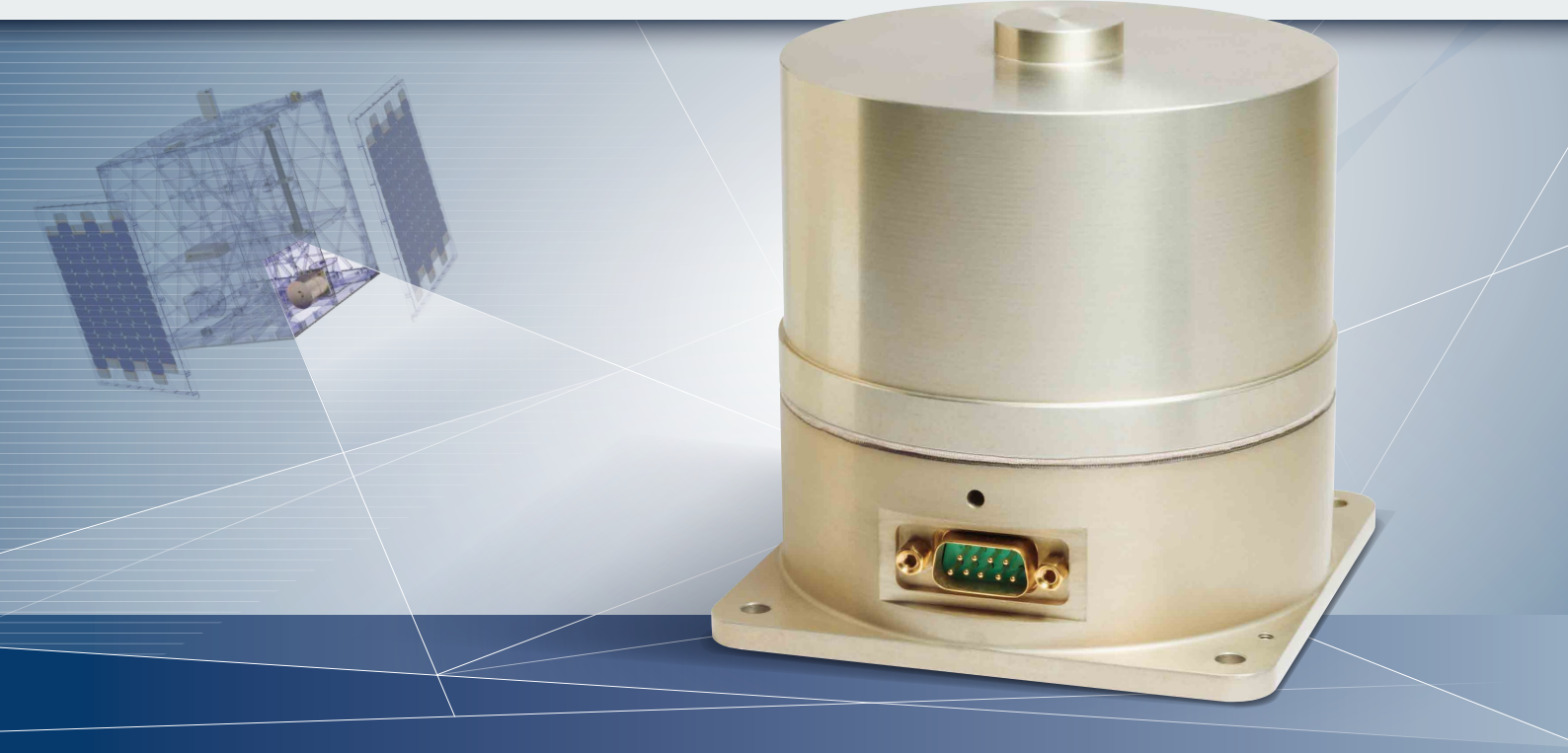
REACTION WHEEL



PERFORMANCE

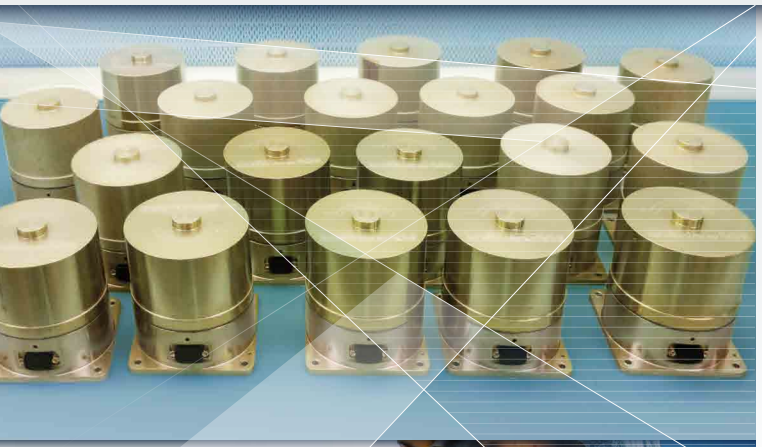
	NRWA-T065	NRWA-T2	NRWA-T6
FUNCTIONAL CHARACTERISTICS			
Max wheel torque	20 mNm	90 mNm	200 mNm (Nominal) 300 Nm (Peak)
Max wheel momentum	0.65 Nms (at 6500 RPM and 20 mNm) 0.94 Nms (at 9000 RPM)	1.41 Nms (at 2600 RPM and 90 mNm) 1.63 Nms (at 3000 RPM)	6Nms (at 3800 RPM and 200 mNm) 7.83 Nms (at 5000 RPM)
Speed range	±9000 rpm	±2600 RPM (Speed/Torque mode) ±3000 RPM (Current mode)	±5000 RPM
Rotor moment of inertia	1.0 x 10-3 kg.m^2	5.2 x 10-3 kg.m2	15 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	210mm x 210 mm x 103.5 mm
Dimensions (electronics)	Internal	Internal	Internal
Mass	1.55 kg	2.8 kg	< 5 kg
ENVIRONMENTAL CHARACTERISTICS			
Thermal (acceptance)	-10 °C to +45 °C	-10°C to +58°C	-20°C to +60°C
Mechanical Tests (qualification)	16.95g_{RMS} (random)	16.95g_{RMS} (random)	14g_{RMS} (random)
Radiation (TID) (qualification)	10 krad (component level)	10 krad (component level)	20 krad TID (component level)
INTERFACES			
Power supply	28 V unregulated	28 V unregulated	28 V unregulated
Power consumption	2.6W (Quiescent) 4W (Steady state at 3000RPM) 6W (Steady state at 6500RPM) 1.7W / mNm	1.7 W (Quiescent) 4W (Steady state at 1500RPM) 4.62W (Steady state at 2600RPM) 0.4W / mNm	6W (Quiescent) 20W (Steady state at 2000RPM) 30W (Steady state at 3800RPM) 83W (200mNm at 2000RPM) 136W (200mNm at 3800RPM)
Data	RS-422	RS-422	Redundant RS-485 (Full duplex)
Connector	9-pin D-type Male	9-pin D-type Male	9-pin D-type Male (Power) 25-pin D-type Male (Data)
Mechanical	4off M5	4off M5	8off M5

ACCEPTANCE TESTING: *All FM parts undergo random vibration (10 rms) as well as thermal cycling (four cycle ambiant 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.*

NEWSPACE SYSTEMS

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-T065, NRWA-T2 and NRWA-T6).

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.

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NEWSPACE SYSTEMS