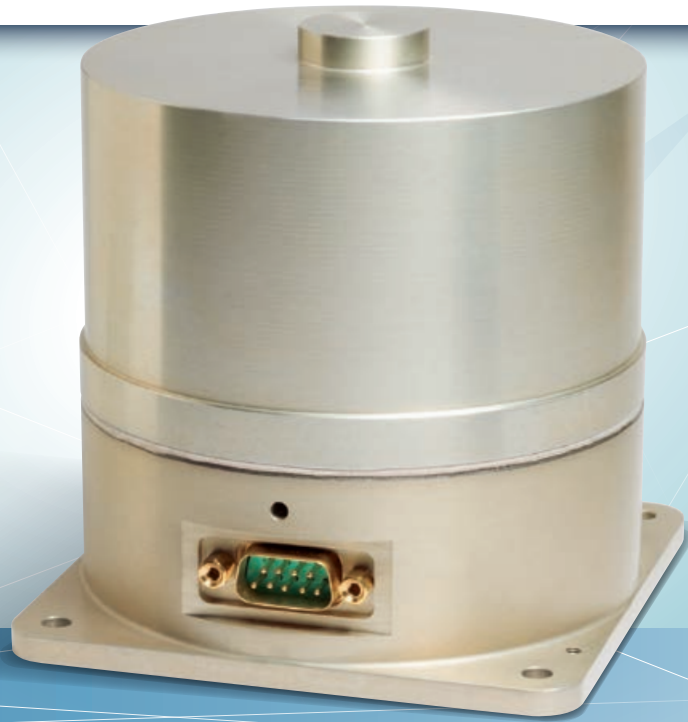
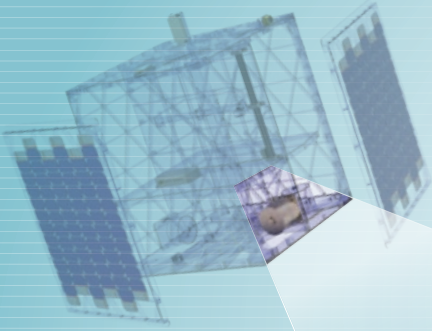


# REACTION WHEEL



## PERFORMANCE

	NRWA-T005	NRWA-T065	NRWA-T10
<b>FUNCTIONAL CHARACTERISTICS</b>			
Max wheel torque	10 mNm	20 mNm	210 mNm
Max wheel momentum	0.05 NmS	0.65 Nms (at 20 mNm)	10.6 Nms (at 5000 rpm and 80 mNm)
Speed range	-9000 to +9000 rpm	-9000 to +9000 rpm	-5000 to +5000 rpm
Rotor moment of inertia	-	1.0 x 10 <sup>-13</sup> kg.m <sup>2</sup>	0.02 kg.m <sup>2</sup>
Speed control accuracy	< 1 rpm @ >100 rpm	< 1 rpm @ >100 rpm	0.6 rpm
<b>PHYSICAL CHARACTERISTICS</b>			
Dimensions (wheel)	75 mm x 75 mm x 75 mm	102 mm x 102 mm x 105 mm	235 mm x 71 mm
Dimensions (electronics)	100 mm x 100 mm x 75 mm	Internal	Internal
Mass	<1.2 kg	1.55 kg	<5 kg
Power	40 Ma / mNm	40 Ma / mNm	0.8W idle; <2 W at 1000 rpm
<b>ENVIRONMENTAL CHARACTERISTICS</b>			
Thermal (operational)	-30°C to +60°C	-30°C to +60°C	-20°C to +60°C
Vibration (qualification)	14g RMS	14g RMS	14g RMS
Radiation (TID)	10krad (component level)	10krad (component level)	10krad (component level)
<b>INTERFACES</b>			
Power supply	28V unregulated	28V unregulated	28V unregulated
Data	RS422 or TTL VART	RS422 or TTL VART	RS422 / CAN
Connector	9-pin D-type (power); 26-pin HD-type (data interface)	9-pin D type male	3 off Micro-D (DMM-10 pin Nicomatic) for power and redundant comms.
Mechanical	4off M3	4off M4	4off M5

**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 (fit for purpose)
- Accurate speed control and inertial rate control
- Simple digital interface to spacecraft bus
- Integration with an optional gyroscope for inertial rate control and inertial angle control modes possible
- Allows for the wheels to be operated independently in current or speed control modes
- Hermetically sealed (not T10)

## 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 qualification of the NewSpace reaction wheels come from flight heritage on the TUBSAT series of spacecraft. The latest generation has been fully flight qualified for the Orbcomm 2nd generation constellation and have flown on the LAPAN-2/3, and other LEO spacecraft in 2014/2015.

## UTILITY

A high performance alternative to a 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-T10).

Typically, three to four reaction wheels are needed to provide full three-axis control of a spacecraft and the additional integration of these wheels with external gyroscopes for 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.