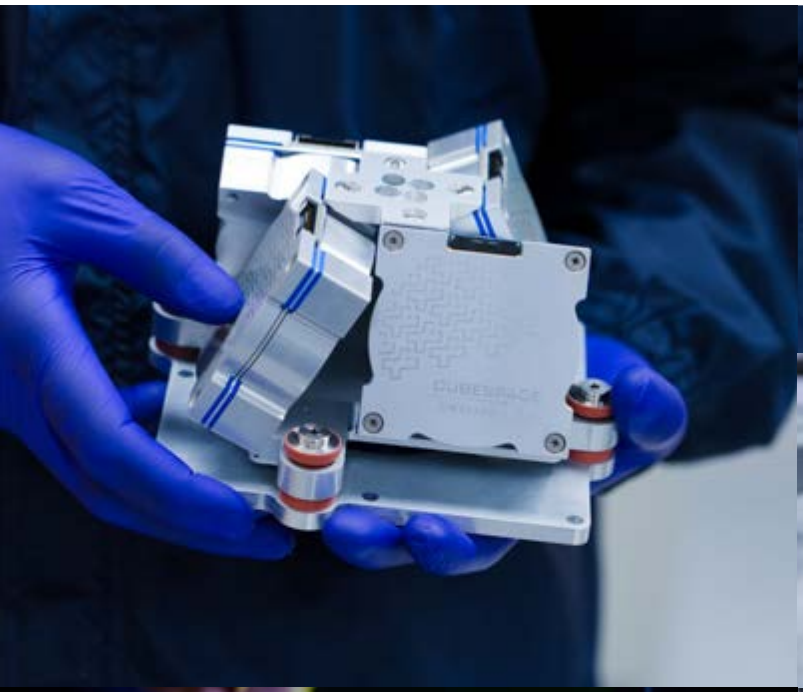
REACTION WHEELS

Space-Proven, High-Performance Range of Wheels

CubeSpace (CS) offers reaction wheels from 1.7mNms suitable for a 3U CubeSat, all the way up to 10Nms suitable for larger MicroSat platforms. Our wheels are built to ensure the highest precision for demanding earth observation missions but are also designed with mass-manufacturing in mind, enabling us to offer the low prices and short lead-times that commercial space missions demand. We ensure unparalleled reliability through built-in full electronic redundancy (including redundant motor windings), as well as using the bearings and lubrication from industry leading suppliers that have decades of experience with long lifetime space missions. All of this is made possible through our in-house designed and manufactured brushless-DC motors which are scaled and optimised for each size reaction wheel.

MICROSAT WHEEL KEY FEATURES

- Full electrical redundancy, including redundant motor windings
- In-house designed and manufactured BLDC motors
- Accelerated lifetime testing done on all wheels
- Kistler table verified vibration measurements and waterfall plots
- Orthogonal or Pyramid mounting configuration
- Pyramid mount includes dampers to dramatically reduce micro-vibrations
- Bearings and lubrication from industry leaders with decades of experience with long-life missions
- Vibration and shock qualified for Falcon 9
- Laser balanced flywheels



*Preliminary Specifications

	CW0017	CW0057	CW0162	CW0500
PERFORMANCE				
Nominal Motor Supply Voltage [V]	6.4	11	11	12
Max Speed @ Nominal Voltage [RPM]	10000	10000	10000	10000
Rated Momentum [mNms]	1.77	5.7	16.2	50
Speed @ Rated Momentum [RPM]	8000	6000	6000	5810
Torque @ Rated Momentum [mNm]	0.23	2	7	10
Imbalance	All reaction wheels are balanced according to IS0-1940 G0.4 (High-Precision Systems) or better.			
PHYSICAL				
Mass [g]	60	115	144	322
Dimensions [mm]	28x28x26	35x35x24.2	46x46x24.2	66x66x26
POWER & DATA				
Data Bus	CAN/UART/I2C/RS-485			CAN/UART/RS-485
Connector	Molex Micro-Lock Plus			
Digital Supply Voltage [V]	3.3	3.3	3.3	3.3
Motor Supply Voltage Range [V]	6.4-16.8	6.4-16.8	6.4-16.8	12-24
Nominal Steady-state Power: at rated momentum [mW] (Includes digital power)	300	770	770	3400
Peak Power: Accelerating at nominal torque, at rated momentum [W] (Includes digital power, excludes Inrush at start-up)	0.85	2.7	7.2	15
QUALIFICATION TEST				
Radiation	24 kRad			
Vibration	14.16g RMS (NASA GEVS)			
Shock	1500g			
Thermal (Vacuum) [°C]	-20 to 80 °C			
Thermal (Hot & Cold Start) [°C]	-35 to 70 °C			

	CW1200	CW2500	CW5000	CW10K*	CW40K*	CW100K*
Nominal Motor Supply Voltage [V]	12	24	24	24	24	TBD
Max Speed @ Nominal Voltage [RPM]	10000	8000	8000	7000	6000	TBD
Rated Momentum [Nms]	0.12	0.25	0.5	1.0	4.0	10.0
Speed @ Rated Momentum [RPM]	5890	5246	5090	5190	3490	TBD
Torque @ Rated Momentum [mNm]	20	27	37	40	120	TBD
Imbalance	All reaction wheels are balanced according to IS0-1940 G0.4 (High-Precision Systems) or better.					TBD
Mass [g]	490	750	1140	1650	3750	TBD
Dimensions [mm]	73x73x31.8	86x86x36.4	100x100x37.5	124x124x47	182x182x64	TBD
Data Bus	CAN/UART/RS-485					TBD
Connector	Harwin Gecko SL					TBD
Digital Supply Voltage [V]	3.3	3.3	3.3	3.3	3.3	TBD
Motor Supply Voltage Range [V]	12-24	16-36	16-36	16-36	16-36	TBD
Nominal Steady-state Power: at rated momentum [mW] (Includes digital power)	3.5	11	9	25	35	TBD
Peak Power: Accelerating at nominal torque, at rated momentum [W] (Includes digital power, excludes Inrush at start-up)	32	33	50	55	100	TBD
Radiation	24 kRad					
Vibration	14.16g RMS (NASA GEVS)					
Shock	1500g					
Thermal (Vacuum) [°C]	-20 to 80 °C					
Thermal (Hot & Cold Start) [°C]	-35 to 70 °C					

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