

MWI Magnetic Bearing Momentum and Reaction Wheels with internal Wheel Drive Electronics



TELDIX® Space Wheels deliver industry leading capability and reliability for spacecraft attitude control.

They are available with an angular momentum storage capacity spanning a range between 0.04 Nms and 68 Nms. The wheels accommodate the requirements of attitude control systems for spacecraft weighing between 30 kg and 5,000 kg.

With more than 30 years experience in Space Wheel technology, our Teldix Space Wheels have accumulated more than 2900 years of in-orbit operational time - far exceeding competing products.

KEY BENEFITS

- › Very low noise
- › Lifetime > 20 years
- › High torque
- › Controls a satellite in more than one axis with a single wheel only

KEY FEATURES

- › Digitally controlled
- › Rad-hard or COTS electronics
- › Rotor gimbaling capacity of $\pm 1.7^\circ$
- › Adaptive interfaces e.g. CAN, RS 485, RS 422

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Main technical data	MWI 30-400/37	MWI 100-100/100
Angular momentum at nominal speed	30 Nms	100 Nms
Operational speed range at nominal speed	± 3,700 rpm	± 10,000 rpm
Speed limiter	± 8,100 rpm	10,100 rpm
Safe speed	12,000 rpm	15,000 rpm
Motor torque at nominal speed	± 400 mNm	± 100 mNm
Rotor gimbaling capacity		
Transverse momentum at nominal speed	0.9 Nms	3 Nms
Gimbaling angle around spin axis	± 1.7 °	± 1.7 °
Gimbaling torque	± 3 Nm (for speeds > 2,000 rpm)	
Resolution of automatic spin axis adjustment (software controlled)	0.002°	0.002°
Imbalance		
Static	< 0.08 gcm	< 0.08 gcm
Dynamic	< 1 gcm ²	< 1 gcm ²
Dimensions		
Diameter	< 300 mm	< 300 mm
Height	< 150 mm	< 150 mm
Mass	< 15.3 kg	< 16.5 kg
Power consumption		
Steady state at 0 rpm	< 10 W	< 10 W
Steady state at nominal speed	< 20 W	< 35 W
Maximum torque at nominal speed	< 300 W	< 300 W
Additional power for rotor gimbaling	Maximum 180 W	Maximum 180 W
Power interface		
Supply voltage	23 to 37 (optional 50) VDC (unregulated))	
Maximum permitted in rush current	< 20 A	< 20 A
Signal interface		
CAN	COTS electronics	
RS 232	COTS electronics	
RS 422/RS 485	COTS or rad-hard electronics	
Environmental conditions		
Temperatures		
Acceptance level	-40 to +70 °C	-40 to +70 °C

Main technical data	MWI 30-400/37	MWI 100-100/100
Survival/ non-operating level	-55 to +85 °C	-55 to +85 °C
Vibration		
Locked for launch	Axial 18 grms	Radial 13 grms
Operational	0.3 grms	0.5 grms
Lifetime	20 years (in-orbit)	
Reliability	400 fit at 30 °C (PRISM, COTS electronics only)	
Radiation safeguarding	COTS electronics shielded by 25 mm Al equivalent, equipped with EDAC, LU-protection. Optional: rad-hard electronics	

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Rockwell Collins delivers smart communication and aviation electronics solutions to customers worldwide. Backed by a global network of service and support, we stand committed to putting technology and practical innovation to work for you whenever and wherever you need us. In this way, working together, we build trust. Every day.

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