



Intelligent Solutions to Reduce Space Mission Costs

# Magnetic Torquers for Spacecraft Attitude Control

Magnetic Torquers interact with Earth's magnetic field and create control torque, which can be adjusted to the required value. Combined with one or more reaction wheels, they provide all the control needed to maintain the spacecraft's attitude, from Low-Earth Orbit up to Geo-Stationary Orbit. Unlike thrusters torquers do not need valuable consumables, are low power components and highly reliable.

Although torquers appear to be relatively simple devices, they require thoughtful design and careful assembly. Our qualification and acceptance testing ensures that there is virtually no potential for degradation neither on the ground nor on-orbit. The torquer's most critical component – its core material – has been treated to ensure optimal magnetic properties. Each unit is totally encapsulated and, except for the core, made from non-magnetic space-grade components.

## Performance

■ Near-zero hysteresis ■ Excellent linearity ■ High maximum dipole moment ■ Adaptation to specific mission requirements is available

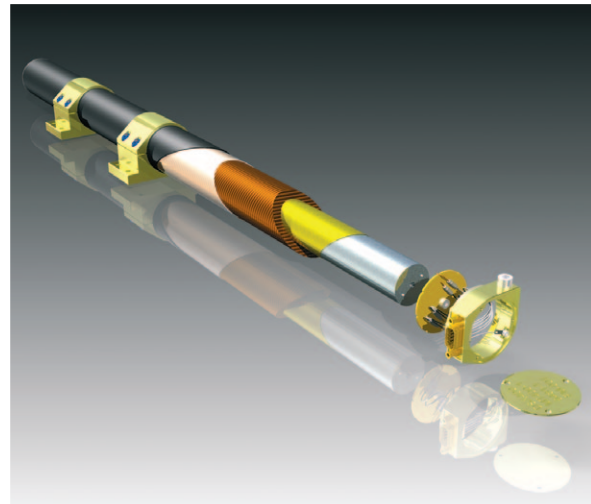
## Design Features

■ Internal floating coil fixation to eliminate mechanical and thermal stress ■ Nickel-alloy cores with special treatment ■ Aluminium brackets (custom designs available) ■ Aluminium-alloy or composite housing tube ■ Double-insulated magnetic coil wires ■ Simultaneous winding of redundant coils ■ ESCC non-magnetic connectors or pigtail ■ Titanium bolts and housing parts ■ Air coil systems using aluminium or CFRP are available

## Our Service

Magnetic Torquers system engineering and attitude control subsystem design support ■ Fabrication and testing of high-performance spacecraft equipment ■ High-precision ACS system simulations ■ Development of the overall solution of your project

Our production process meets the highest standards for performance and workmanship with excellent quality control.



## Off-the-Shelf Models

Type	Linear Dipole Moment (Am <sup>2</sup> )	Linear Voltage (V)	Linear Power (W)	Mass (kg)	Length (mm)	Dia. (mm)
MT2-1	2	5.0	0.5	0.2	157.5	15
MT5-2	5	5.0	0.77	0.3	240.0	18
MT6-2	6	5.0	0.5	0.3	325.0	14.5
MT10-2-H	10	10.0	1.0	0.35	330.0	17
MT10-2-AIR	10	11.0	1.1	2.7	1120x584x95 mm	
MT15-1	15	14.0	1.11	0.43	329.5	17
MT30-2	30	12.5	1.5	1.4	404.5	29
MT70-2	70	24.0	2.6	2.2	581.0	30
MT80-1	80	10.0	3.0	4.1	380.5	50
MT80-2	80	28.0	4.7	2.3	500.0	32
MT110-2	110	12.0	2.9	3.8	600.0	40
MT120-1	120	14.0	2.4	2.7	670.0	30
MT140-2	140	10.0	1.9	5.3	680.0	43
MT250-2	250	28.0	4.8	5.5	883.0	37
MT400-2	400	21.0	9.0	11.0	750.0	56
MT400-2-L	400	18.5	11.4	7.8	952.0	41





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Orbital Sciences | Politecnico di Milano | SpaceDev  
TAI · Turkey | US Air Force | US Navy | Verhaert Space



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## Magnetic Torquers for Spacecraft Attitude Control Improve Your Attitude!

ZARM Technik Magnetic Torquers supported more than 50 international satellite missions. Not a single magnetic torquer out of over 170 units has ever failed. For more than 12 years we produce and improve intelligent technical solutions to reduce space mission costs. Our experience led to an outstanding flight heritage and satisfied clients all over the world.

**ZARM Technik AG** is one of the leading suppliers for attitude control equipment. It was founded in 1997 as a spin-off company and commercial branch of the university institute ZARM.

ZARM Technik AG is specialised in providing customised attitude determination and control system solutions covering special hardware and software developments. Today ZARM Technik AG produces and delivers space technology products for small low cost satellites as well as for large scale constellations. Test and engineering services can be offered in cooperation with ZARM and other organisations.

**ZARM, Center of Applied Space Technology and Microgravity**, is a scientific institute at the University of Bremen, established in 1985. Being the largest university space research center in Europe, it concentrates on the investigation of fluid mechanic phenomena and fundamental physics in particular under microgravity conditions, and questions related to space technology.

The most outstanding facility is the **Drop Tower Bremen**, which provides up to 9.3 seconds of microgravity in an earthbound laboratory.

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