



Improve Your Attitude!

Magnetic Torquers for Micro-Satellites

Magnetic Torquers interact with Earth's magnetic field and create control torque, which can be adjusted to the required value. They provide all the power needed to maintain the spacecraft attitude.

The Magnetic Torquers offered were designed to meet the special requirements of micro-satellites and cubesats. A PCB solderable version was specifically designed for cubesat application where mounting space and mass is limited.

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

Parameter	MT0.1-1	MT0.2-1	MT0.2-1	MT0.3-1	MT0.5-1	MT0.5-1	MT1-1	Tolerance, remark
	Mass optimised	Mass optimised	Power optimised	Mass optimised	Power optimised	PEEK housing	PEEK housing	
Linear dipole range	$\pm 0.1 \text{ Am}^2$	$\pm 0.2 \text{ Am}^2$	$\pm 0.2 \text{ Am}^2$	$\pm 0.3 \text{ Am}^2$	$\pm 0.5 \text{ Am}^2$	$\pm 0.5 \text{ Am}^2$	$\pm 1 \text{ Am}^2$	at max. linear supply voltage 21.5 °C
Linear current range	59 mA	60 mA	28 mA	63 mA	55 mA	60 mA	46 mA	at maximum linear dipole moment
Linear power consumption	295 mW	300 mW	140 mW	315 mW	275 mW	300 mW	230 mW	$\pm 5\%$, at 21.5 °C
Linear supply voltage range	$\pm 5 \text{ V}$	$\pm 5 \text{ V}$	$\pm 5 \text{ V}$	$\pm 5 \text{ V}$	$\pm 5 \text{ V}$	$\pm 5 \text{ V}$	$\pm 5 \text{ V}$	at 21.5 °C
Linearity error	< 2 %	< 2 %	< 2 %	< 2 %	< 2 %	< 2 %	< 2 %	at max. linear dipole moment
Residual dipole	$\leq 0.5\%$	$\leq 0.5\%$	$\leq 0.5\%$	$\leq 0.5\%$	$\leq 0.5\%$	$\leq 0.5\%$	$\leq 0.5\%$	$\leq 0.3\%$ typically of max. non-linear dipole moment
Coil resistance	85 Ω	83 Ω	180 Ω	80 Ω	91 Ω	82 Ω	108 Ω	$\pm 5\%$ at 21.5 °C
No. of Coils	1	1	1	1	1	1	1	
Interface connection	PCB solderable	PCB solderable	Flying leads	Flying leads	Flying leads	Flying leads	Flying leads	
Unit length	< 55 mm	< 70 mm	< 85 mm	< 90 mm	< 100 mm	95 mm	132 mm	$\pm 0.5 \text{ mm}$
Diameter	3.5 mm	5 mm	6 mm	5 mm	9 mm	12 mm	13.5 mm	
Unit mass	< 3 g	< 7 g	< 9 g	< 9 g	< 30 g	< 35 g	< 60 g	

Performance

- Near zero hysteresis
- Excellent linearity
- High maximum dipole moment
- Lower mass, power consumption and size than comparable air coils

Design Features

- Nickel-alloy cores with special treatment
- Aluminium or PEEK mounting brackets
- Custom mounting designs available
- Double insulated coil wires
- Soldered directly to PCB or pigtail I/F connection

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.





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HS-Bremen – Venta | HS-Bremen – AlSat

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Intelligent Solutions to Reduce Space Mission Costs Magnetic Torquers for Micro-Satellites

ZARM Technik Magnetic Torquers supported more than 50 international satellite missions. 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 now also provides solutions for micro-satellites and cubesats.

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 micro-gravity 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.

ZARM Technik AG Holger W. Oelze
Am Fallturm · 28359 Bremen · Germany
Phone +49 421 218 - 2154 · FAX +49 421 218 - 7473
holger.w.oelze@zarm-technik.de
www.zarm-technik.de

