

MACCON develops and supplies high-performance electric motors and customized electromagnetic designs for demanding space environments.

Typical configurations include 3-phase, multi-pole, inner rotor PM-BLDC motors with brushless architecture, optimized for precise control and high reliability.

Outer rotor variants and alternative motor technologies are also available, tailored to specific mission requirements.

Our Solutions

- Permanent Magnet Synchronous Motors (PMSM)
- Brushless DC Motors (BLDC)
- Stepper Motors
- Limited-Angle Torque Motors
- Zero-Cogging Motors
- Magnet-Free Reluctance Motors
- Linear Motors and Voice-Coil Actuators
- Rotary and Linear Solenoids

Kit Motors



Housed Motors

Key Features

- Customized motor designs for mission-specific requirements
- Manufacturing based on ESA standards
- Frameless kit motors for direct mechanical integration
- Housed Motors opt. with gearboxes
- Hollow-shaft and thin-ring configurations
- Optimized for minimal mass and low energy consumption
- Redundant designs available on request
- Low outgassing & vacuum compatibility
- Cryogenic and high-temperature options available

Typical Motor Parameters

Operating voltage	5 - 90 V (higher ranges available on request)
Torque range	0.05 - 15 Nm (higher torque versions available)
Speed range	5 - 3.000 rpm (up to 25.000 rpm for fluidic pumps)
Outer diameter range	20 - 200 mm
Overall length range	10 - 100 mm

Typical Environmental Conditions

Operating temperature range	-40°C to +105°C (Optional -55°C to +125°C)
Low outgassing	TML < 1%, CVCM < 0.1%
Radiation	TID = 30KRAD (higher radiation tolerance available on request)

Space-Rated Motors

Linear & rotary direct drives | Limited Angle Torquers | Servomotors

Selection of Space Programs employing MACCON Motors

Satellite/Mission	Mechanism	Application
Ariane 6	FLPP-HCV	Valve actuator
Ariane 6	FLPP-OCV	Valve actuator
BepiColombo	Antenna, de-spin	ADM Actuator
BepiColombo	STR	Shutter
BepiColombo	Simbio-SYS	Shutter
Chang'e 5	Lunar Drilling	Actuator
Columbus/ISS	Biolab micro-gravity	Centrifuge
Cosmo 2nd.Gen	AU1, AU2	CMG
EnMap	FHD Actuator	Shutter
FY-3	MWHS	Scanner
FY-3	TRIPM	Filter wheel actuator
LEMA	IBDM Actuator	Docking
MeteoSAT		Dual-scanner
MetOp NG	MWS, MWI/ICI	Scanner
MetOp NG	METimage	Scanner
OPTEL	TESLA Motor	Scanner
PRISMA	Small	Shutter

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Satellite/Mission	Mechanism	Application
PRISMA	Main Port	Shutter
PRISMA	Solar Port	Shutter
Sciamachy	Main	Scanner
Sentinel 3	SLSTR OME, SDM	Scanner
Sentinel 3	SLSTR OME, FMM	Shutter
TerraSAR-X	LCTSX	Laser comm.
FY-3	MWRI SCM	Scanner
FY-3	MWRI SDM	Scanner
LiQuaRD	LIDAR	Scanner
Commercial Space	CPA Azimuth	Laser comm.
Commercial Space	CPA Elevation	Laser comm.
PLATiNO	CMG	Actuator
K 425	CMG	Actuator
AWS (Artic weather satellite)	Cross-Track-Mikrowellenradiometer	Actuator
I-HAB	ATCS (Active Thermal Control System=	Valve actuator
	RVS3000	LIDAR Modul (Scanner)
Badr-8	TELEO Demonstrator	Laser-based satellite communication

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Engineering & Design Services

- Electromagnetic design studies
- Magnetic stray-field analysis
- Servo system analysis and simulation
- Design analyses, including:
 - Interface design
 - Mechanical design
 - Thermal analysis
 - Radiation analysis

Control Electronics

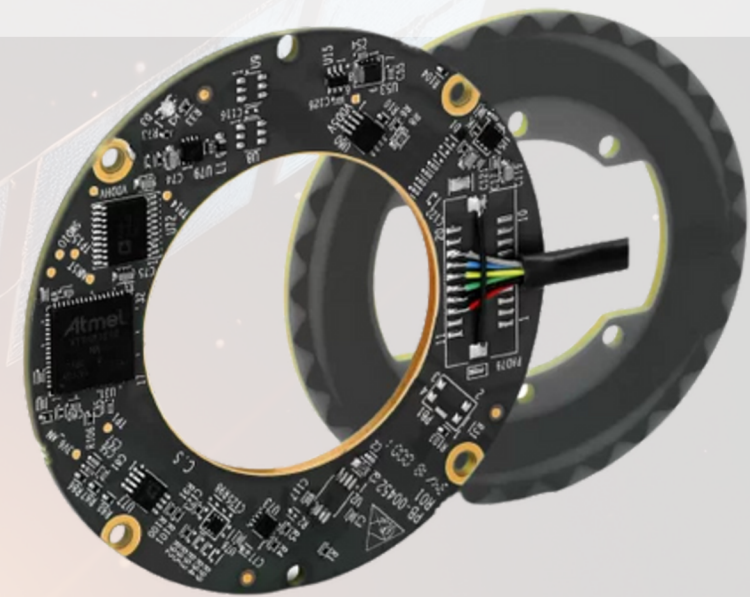
- Motor power and control electronics for space programs
- Support digital commance interfaces (e.g. SpaceWire) and position feedback devices

Position sensors & feedback devices:

- Integrated Hall-effect commutation sensors
- Absolute Position Sensors from MACCON, and Netzer, also 3rd party encoders
- Typically hollow-shaft (flexible ID); low-profile, redundancy possible

Qualification & Test

- Thermal-vacuum testing
- Shock and vibration testing
- Electromagnetic compatibility (EMC) testing
- Outgassing tests
- Performance tests



VLS Series | ABSOLUTE ROTARY ENCODER | Leo - Space | Hollow Shaft