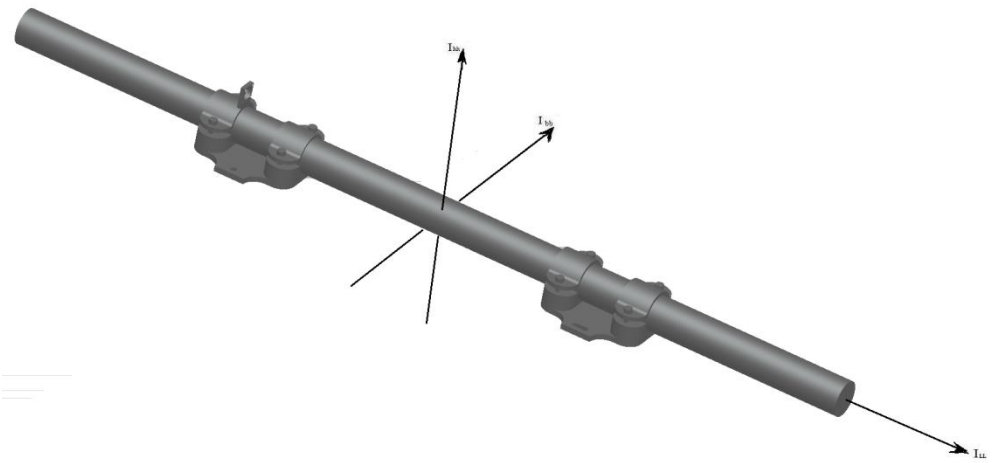
MQ Series
Magnetorquers

Magnetic bars

Circuit board

PRODUCT DESCRIPTION

The magnetorquer is the executive component of a satellite attitude control system. Inside the magnetorquer are the soft alloy rods with high permeability, low residual magnetism and low-loss. The outer layer is wound with enameled wire. The unit is orthogonally installed inside the satellite. A current supplied by the control computer passes through the magnetorquer and generates a proportional magnetic moment M. This magnetic moment then generates a reaction torque T with the Earth's magnetic field B. T = M × B is the satellite control torque which is used for the reaction wheel to unload momentum and control satellite attitude.
Usually, the magnetorquer and the magnetometer share the same circuit box. The magnetic bar is a $Ni_{36}Fe_{64}$ alloy which has a high saturation magnetic induction intensity and low coercive force. It keeps sonly a small residual magnetic torque level maintaining the linear relationship between magnetic torque and coil current. The circuit board is used to control magnet current with two controlling methods: switching and linear controlling. The switching type uses switch and a direction signal to control, and only outputs the maximum magnetic torque. The linear control type outputs the linear magnetic torque. The output magnetic turque can be customized, ranging from 1 ~ 200Am^2.



STEREOGRAM OF MAGNETIC BAR

MQ Series

Magnetorquers

SPECIFICATIONS

MQ10 : 10 Am^2 magnetic bar	
Magnetic moment	±10Am^2
Residual magnetic moment	≤0.1Am^2
Operating voltage	10V
Operating current	≤40mA
Power consumption	≤0.4W
Ascending time tr（0～90%）	≤200ms
Descending time tp（100%～10%）	≤80ms
Working temperature	-25℃～+60℃
Mass	0.45±0.05kg
Dimensions (mm)	310±3 x 56±0.5 x 44±2
MQ200 : 200 Am^2 magnetic bar	
Magnetic moment	≥200Am^2
Residual magnetic moment	≤2Am^2
Working voltage	40V
Working current	≤100mA
Power consumption	≤4.0W
Ascending time tr（0～90%）	≤250ms
Descending time tp（100%～10%）	≤100ms
Operating temperature	-25℃～+60℃
Mass	4.1±0.1kg
Dimensions (mm)	840±3 × 100±1 × 61±1
Life (years)	> 5
Flight Heritage	> 10 missions

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