DIGITAL Magnetic Bearing Systems

A profitable choice
**Magnetic bearings – a convincing alternative**

The bearing force in a magnetic bearing system is generated by an electromagnet, which serves to hold the rotor in a levitated position. The rotor is monitored constantly by a set of sensors that transmit signals to a digital controller at a rate of up to 10,000 cycles per second. The controller then measures any possible deviation of the rotor from its nominal position and supplies the current required to maintain rotor stability by means of a power amplifier.

**Digital control for high flexibility**

The Mecos digital control system is extremely flexible and can be adapted to almost any application; this considerably simplifies the overall development of your entire system. Serial production becomes more economical as digital controllers offer an efficient and precise method of replication. Should new requirements arise during application, only your software will have to be adjusted. Moreover, our controllers feature built-in vector control for synchronous motors that can be used either with a MECOS inverter or a power output stage from a third party vendor.

**Communicative systems**

The digital controller tracks the rotor position and bearing force on-line. The magnetic bearing control device can be integrated into another system, which monitors the entire process. Data can be recalled and exchanged at any time, and troubleshooting via modem is also possible.

The Mecos digital control system is characterized by flexibility and the capacity to communicate. Adaptation of the active magnetic bearing system to the application, and to any further changes in application requirements, can be carried out simply and efficiently.
... in high-speed machinery
Rotational speed is limited only by the strength of the rotor material itself—magnetic bearings allow rotational speeds in excess of 100,000 rpm, resulting in higher power density from which turbo machines, centrifuges, machine tool spindles, and flywheels for energy storage can all benefit.

... to avoid vibration
Our magnetic bearings work to compensate for rotor imbalances, actively minimizing the vibration transmitted to the bearing casing, and thus to the system. This is particularly crucial in high-speed applications such as centrifuges.

... in extreme conditions
Magnetic bearings will continue to function at both very high and very low temperatures, and can be installed in almost any medium. These characteristics are a great advantage in gas turbines, as well as in cryogenics, biotechnology, and process engineering.

... to reduce friction loss
Levitated rotors run without friction. Magnetic bearings can even be operated in a vacuum, allowing the reduction of gas friction loss, a feature useful for storing energy and operating high-efficiency machines.

... in sterile conditions
As they require no lubricants and are not subject to abrasion, magnetic bearings cause no contamination of machinery. This makes them ideal for use in ultra-high vacuum conditions and in the food industry, where hygiene standards are particularly rigorous.

Being subject to few technical limitations, magnetic bearings offer untold design possibilities for a variety of applications. Magnetic bearing systems reduce friction loss and operate without lubricants. They do not wear and are maintenance-free, which extends their life almost indefinitely while significantly reducing operating costs.
A systematic approach to SERIAL
Rapid assessment of your needs
Our specialists cooperate closely with you to analyze the technical and economic particulars of the proposed application. We offer advice concerning feasibility and provide outlines of initial proposals, including cost estimates, followed by a detailed offer for system adaptation and serial production.

Developing solutions together
We work closely with your own technical team to develop a magnetic bearing system custom-designed to suit your needs – a process made possible by our flexible software. Throughout our cooperation – from the creation of a prototype to an extensive test phase and the subsequent optimization of your system with our software – we have a single aim: to match the solution precisely with the application.

On-schedule serial production
Serial production is carried out by selected, qualified partners. We monitor all production steps using a standard system of production management devised to ensure on-time manufacture and delivery. Once delivered, the systems can be put into operation efficiently without further tuning, thanks to the capabilities of Mecos software – one self-calibration, and the system is ready to run.

Guaranteed quality – reliable operation
All magnetic bearing components are industrially tested and meet the highest standards of quality assurance during production. Built-in diagnosis capabilities will enable you to recognize and deal with problems. At the same time, these capabilities are also an invaluable aid to preventive maintenance.

Every phase – including development, serial production, and commissioning – is conducted with one purpose in mind: finding a solution that is precisely designed to meet the requirements of our business partners.
Applying

TOMORROW’S technology today

Our expertise — your advantage
Our development department includes mechanical engineers, electronics and software development specialists, each drawing on years of experience and a wealth of technical skills to create a variety of magnetic bearing applications. Our team of experts will offer you sound advice and are committed to finding the best solution for your needs.

In the vanguard of technical progress
We maintain close contact with researchers at several universities, and immediately employ new, practically applicable knowledge in the development of our magnetic bearing systems. Our objective is to constantly improve the efficiency of our systems while ensuring that costs are kept to a minimum.

Leaders in the digital control market
MECOS AG is a market leader in the development and manufacture of digitally controlled magnetic bearing systems for a variety of industrial applications — a direct result of the technical skills, innovative spirit, and dedication of our team. Continuous product development and a network of highly competent production partners enable us to produce systems with an optimum price-performance ratio.

Our industrially proven magnetic bearings are the fruit of extensive technical research, opening up possibilities of application unheard of with traditional bearings. Mecos offers you viable and flexible solutions — whatever your market needs may be.