

# Helmholtz Coils

Magnetic Field Generation and Compensation



*Sensor calibration  
Magnetic field  
compensation &  
generation*

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## Magnetic Field Generation and Compensation

Magnetic fields can be generated and controlled using single- and multi-axis coil systems. Our 3-axis Helmholtz coils are particularly suitable for compensating of the earth's magnetic field and for generating particularly homogeneous magnetic fields. They are characterized by a precise coil arrangement and can be controlled reliably and with high precision, using our linear bipolar power sources from matesy.



### Product Description

A coil arrangement consisting of two coils with the same radius or edge length is called a Helmholtz coil. At the correct distance, these coils are arranged in parallel on the same axis and current flows through them in the same direction. Their magnetic field is then characterized by a large homogeneous area in the center of the coil, which is freely accessible for experiments and measurement tasks. Helmholtz coils can have a circular or square geometric shape.



### Design & Function

Matesy Helmholtz coils can be used to generate precise magnetic fields in different spatial directions, which simultaneously compensate the earth's magnetic field and expose your test object to a defined magnetic field value. To do this, our experts design the size, winding and power source according to your requirements. By integrating our reference sensors, we measure the set field and can also readjust it. Helmholtz coils are ideal for calibrating sensors such as: Hall-, magnetoresistive- (XMR), fluxgate- and SQUID-magnetometers.

## Software

The matesy studio software offers the option of loading and outputting standard and individual control signals, and measuring and saving of the generated magnetic fields in real time. With the help of the reference sensor, the earth's magnetic field can be compensated and the control signals can be regulated in a closed loop



## Application Areas:

- Sensor calibration (nT to mT range)
- Earth magnetic field compensation
- Generation of arbitrarily directed test fields

## Product Highlights

- Modular construction
- Custom calculation and production according to your requirements
- Linear current sources for absolute accuracy and high field resolution
- DC, AC and customer-specific adjustable field signals
- Magnetic shielding chamber for maximum measurement accuracy on request

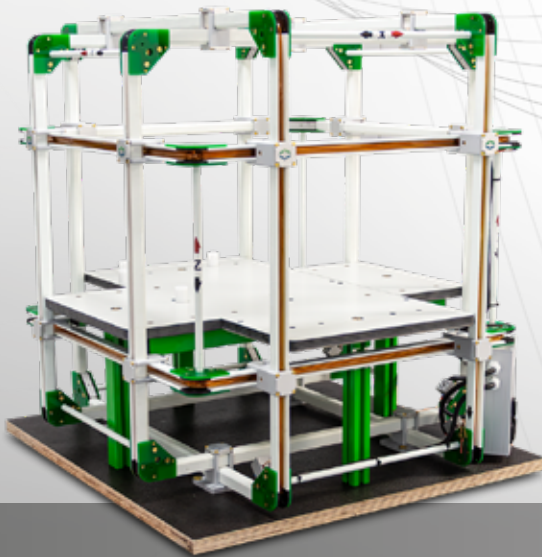
## Advantages

- Single-, two- and three-axis versions available
- Real-time magnetic field and coil current monitoring
- Field configuration control through user-friendly software
- Compensation of the earth's magnetic field
- Interface for integration into industrial environments
- Integrated reference sensor

## Technical Specifications

- Different sizes to create precise magnetic fields
- Control of field configuration by software
- Edge length / diameter: 10 cm to 4 m
- Field range:  $\leq 5\text{mT}$
- Temperature range:  $-10^{\circ}\text{C} - 60^{\circ}\text{C}$
- Control: via PC or signal inputs
- Angle error:  $\leq 0.1^{\circ}$
- Frequencies: 0 – 1000 Hz
- Homogeneous 3D magnetic fields:  $\leq 0.1\%$





## Contact & information

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