

# Helmholtz coil systems

Customized coils systems



Your partner for magnetism and lead testing

# Helmholtz coil systems

## Magnetic field generation & compensation

Magnetic fields can be generated with multi-axis coil systems. Our 3-axis Helmholtz coils are particularly suitable for compensating the earth's magnetic field and for generating especially homogeneous magnetic fields. They are characterized by a precise coil arrangement and can be controlled with a power amplifier.

## Highlights

- Modular design in different sizes
- Single-axis and triple-axis versions available
- Control of field configuration through user-friendly software
- Compensation of the earth's magnetic field
- Precise calibration of highly sensitive sensors



Picture: wooden coil



Picture: modular aluminum coil

A Helmholtz coil is a coil arrangement consisting of two short coils with a large radius or edge length. At a distance of the radius or edge length, these coils are set up in parallel on the same axis and current flows through them in the same direction. Their field is characterized by a bell-shaped increase up to the coil center. By superimposing both fields, an area with a largely homogeneous magnetic field is generated between the two coils near the coil axis, which is freely accessible for experiments and measurement tasks..

## Structure and functionality

The geometry of a Helmholtz Coil is either cylindrical or quadratical. Due to its three-dimensional arrangement magnetic fields can be generated in any direction by the variation of the current ratio between both coils. The strength of the magnetic field depends on the coil current linearly and is nearly location-independent (interiorly).



Picture: 3D printed coil

Given the coil geometry, current and number of windings the magnetic field strength can be calculated analytically along the axis. The Helmholtz Coil is an excellent device for the calibration of sensor technology, such as HALL-, magneto-resistive, Fluxgate- and SQUID-magnetometers.

## Technical specifications

- Edge length / diameter: 10 cm to 10 m
- Field range:  $\leq 5$  mT
- Control: via PC or manually
- Temperature range:  $-10^{\circ}\text{C}$  -  $60^{\circ}\text{C}$
- Angular error:  $\leq 0.1^{\circ}$
- Frequencies: 0 - 200 Hz



Picture: coil system with amplifier carriage



## Contact & information

Matesy GmbH  
Löbstedter-Str. 101-103  
D-07749 Jena  
Germany

Tel.: +49 (0) 03641 79799 00  
Fax: +49 (0) 03641 79799 01  
E-mail: [info@matesy.de](mailto:info@matesy.de)  
Web: [www.matesy.de](http://www.matesy.de)

