



The simple, economical solution that never goes out of style

Integrating fluxmeters are often used to control permanent magnet devices by the use of sense coils. The Laboratorio Elettrofisico Helmholtz coils are an easy addition to any fluxmeter for a fast, accurate and low cost measuring technique to control the quality of permanent magnets. Our design consists of a pair of identical wound coaxial coils, connected in series at a fixed distance equal to their radius. This configuration permits the sample to be placed in a large uniformity central volume.

KEY BENEFITS

- Easy to use
- Low cost
- Precise and accurate
- Meets international standards (IEC 60404-14)
- Non-destructive method of testing
- Feedback control for calibration and magnetization system

MEASURING PRINCIPLE

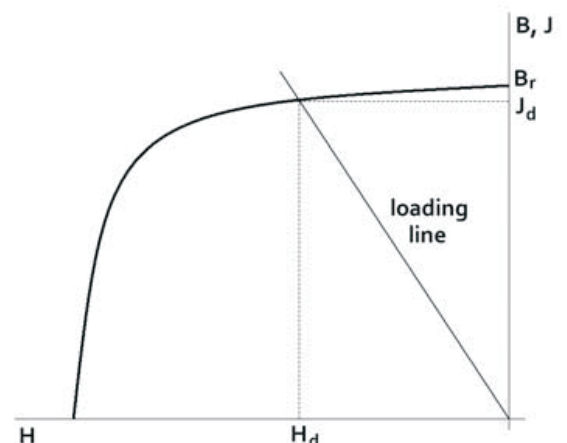
When connected to a fluxmeter, the Helmholtz coil provides an output flux Φ proportional to the magnetic moment M of the sample: $\Phi = K_H \cdot M$, where K_H is the coil's constant (each coil is given with the proper certified constant).

This measurement procedure is described in the International Standard IEC 60404-14.

The magnetic moment is an essential magnetic property. For a permanent magnet sample, the magnetic moment M is the product of its magnetic polarisation J_d (in the working point) and its volume V ; this gives directly the Helmholtz coil's formula:

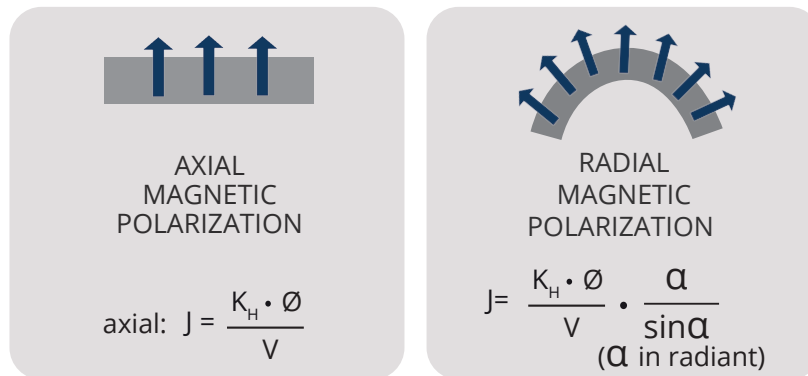
$$J_d = \frac{K_H \cdot \Phi}{V}$$

For example: for ferrites and rare earth magnets, having essentially a linear J vs. H relationship in the second quadrant, the J_d is very close to the magnetic remanence B_r .



HOW IT WORKS

When connected to a fluxmeter, the Helmholtz coil provides an output flux Φ proportional to the magnetic moment M of the sample: $M=K_H \Phi$ where K_H is the coil's constant (each coil is provided with its own certified constant). This measurement procedure is described in the International Standard IEC 60404-14.

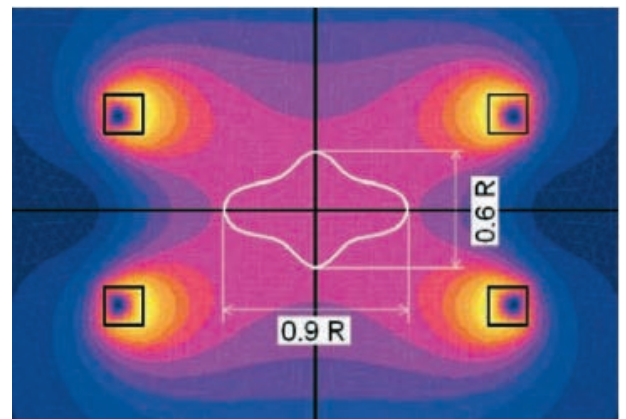


HOW TO MEASURE

How to choose the right Helmholtz coil size

The large volume with field uniformity in the center of the Helmholtz coils is approximately an ellipsoid having a major axis of 0.93 R and a minor axis of 0.62 R. The magnet to be measured should fit within this volume to have the best reading accuracy (uniformity within 1%).

The resulting Helmholtz coil measurement is an intrinsic quantity (the magnetic moment) of the sample that can be used as the reference criteria for cross-comparison (between suppliers, customers, etc) and quality control (QC).



MODELS AVAILABLE

Models	Diameter	K_H (typical)	Measurement Volume
HM/R15	32 mm (1.18")	$4.5 \cdot 10^{-5}$ m	12 mm (0.47") - H 9 mm (0.35")
HM/R32	64 mm (2.52")	$1.1 \cdot 10^{-4}$ m	29 mm (1.14") - H 19 mm (0.75")
HM/R58	116 mm (4.57")	$4.5 \cdot 10^{-4}$ m	53 mm (2.086") - H 34 mm (1.338")
HM/R100	200 mm (7.87")	$2.8 \cdot 10^{-3}$ m	90 mm (3.543") - H 60 mm (2.362")
HM/R150	300 mm (11.81")	$7.3 \cdot 10^{-3}$ m	135 mm (5.314") - H 90 mm (3.543")
HM/R250	500 mm (19.69")	$8.8 \cdot 10^{-3}$ m	225 mm (8.86") - H 150 mm (5.91")

Size 32/58/100 always in stock.
Customized models are also available upon request.