



The simple, economical solution that never goes out of style

The Helmholtz coil refers to the arrangement of two identical conductor loops spaced one radius apart and wound, so that the current flows through both coils in the same direction. This winding generates an almost homogeneous magnetic field in the center of the structure with the primary component parallel to the axes of the two coils. Measurement of magnetic moment with a Helmholtz coil is a convenient way to test permanent magnet materials.

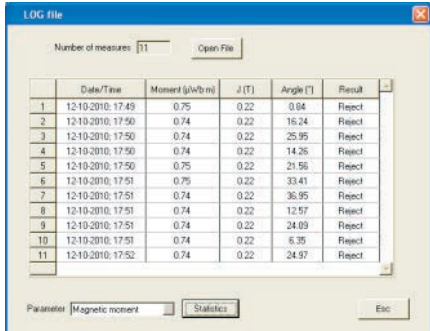
The Helmholtz coils can be single-axis (one coil pair) or 3-axes (three coil pairs at 90 degrees from each others). The triple-axes version lets you fully characterize the magnitude and the direction of the magnetization with respect to the axes, regardless of how you place the magnet. The complete measurement system consists of a 3-Axes Helmholtz coil set, a cabinet containing three fluxmeters and a PC. Detailed specs are listed in the following.

## KEY BENEFITS

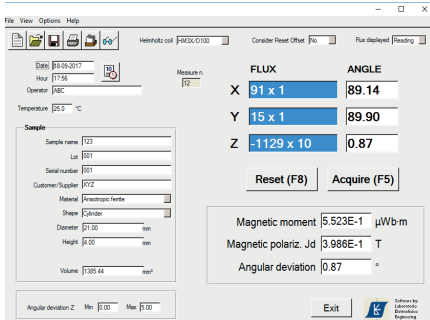
- Meets international standard IEC 60404-14
- Control of PM quality (Br)
- Feedback control for calibration and magnetization system
- Easy to use
- Precise and accurate
- Non-destructive method of testing

## HOW IT WORKS

- Simply insert the magnet in the coil
- Dedicated software (F-1.0) will manage the flux values and calculate the magnetic moment and angular deviation
- Software provides also to visualize a data base and a perform statistic analysis of the measurements



	Date/Time	Moment (μWb/m)	J (T)	Angle (°)	Result
1	12-10-2010: 17:49	0.75	0.22	0.04	Reject
2	12-10-2010: 17:50	0.74	0.22	16.24	Reject
3	12-10-2010: 17:50	0.74	0.22	25.95	Reject
4	12-10-2010: 17:50	0.74	0.22	14.26	Reject
5	12-10-2010: 17:50	0.75	0.22	21.56	Reject
6	12-10-2010: 17:51	0.75	0.22	33.41	Reject
7	12-10-2010: 17:51	0.74	0.22	36.95	Reject
8	12-10-2010: 17:51	0.74	0.22	12.57	Reject
9	12-10-2010: 17:51	0.74	0.22	24.09	Reject
10	12-10-2010: 17:51	0.74	0.22	6.35	Reject
11	12-10-2010: 17:52	0.74	0.22	24.97	Reject



File View Options Help

Helmholtz coil FREQ:0100 Consider Reset Offset [No] Flux displayed [Fluxing]

Est: F1262017  
 Hz: F156  
 Operator: F16C  
 Temperature: F150 °C

Sample  
 Sample name: F13  
 Lot: F11  
 Serial number: F11  
 Customer/Supplier: F12

Material: F160000-ferite  
 Shape: F160000  
 Diameter: F120 mm  
 Height: F100 mm  
 Volume: F150.64 mm<sup>3</sup>

Angular deviation Z: Min: F10 Max: F100

Measure: FLUX ANGLE  
 X: 91 x 1 89.14  
 Y: 15 x 1 89.90  
 Z: -1129 x 10 0.87

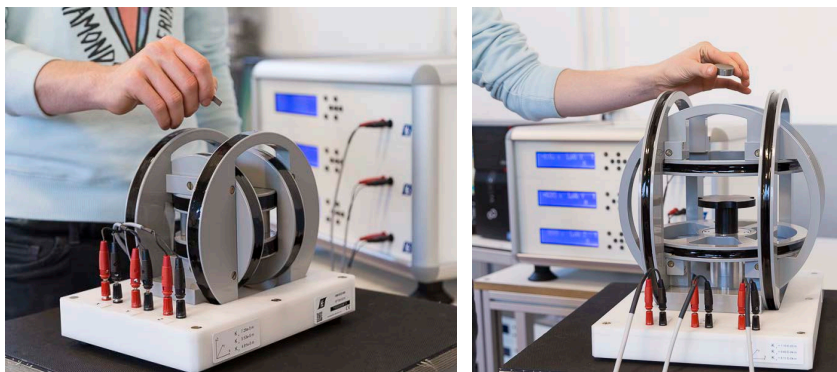
Reset (F8) Acquire (F5)

Magnetic moment: 5.523E-1 μWb-m  
 Magnetic polariz. Jd: 3.986E-1 T  
 Angular deviation: 0.87 °

Exit

## 3-AXES HELMHOLTZ COIL SET

- Service cabinet with 3 digital fluxmeters
- Helmholtz coil
- PC with software (F-1.0)



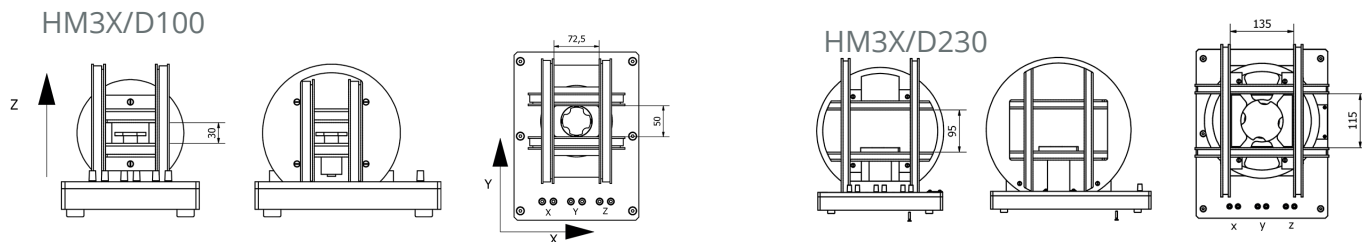
## TECHNICAL SPECS

Fluxmeter's accuracy	+/- 0.5%	Resolution	from 1 $\mu$ Wb
Measuring ranges	1, 2, 5, 10, 20, 50, 100 x 2000 $\mu$ Wb	Communication port	Ethernet
Power supply	220 VAC $\pm$ 10; 50/60 Hz, 16 A	Cabinet dimension	545 x 520 x 360 mm

The measure can be done to every kind of hard magnetic materials having any different magnetization direction. This system was developed to be used with 3-axes Helmholtz coils, but it can also be used with any single-axis Helmholtz coil.

## MODELS AVAILABLE

Two standard models of coil available, but any custom solutions can be evaluated.



	<b>HM3X/D100</b>	<b>HM3X/D230</b>
Minimum coil's diameter	100 mm	230 mm
$K_H$ (typical)	$5 \cdot 10^{-5}$ m	$1 \cdot 10^{-3}$ m
Min measurable volume	5 mm <sup>3</sup>	500 mm <sup>3</sup>
Max measurable volume	10 cm <sup>3</sup>	125 cm <sup>3</sup>



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