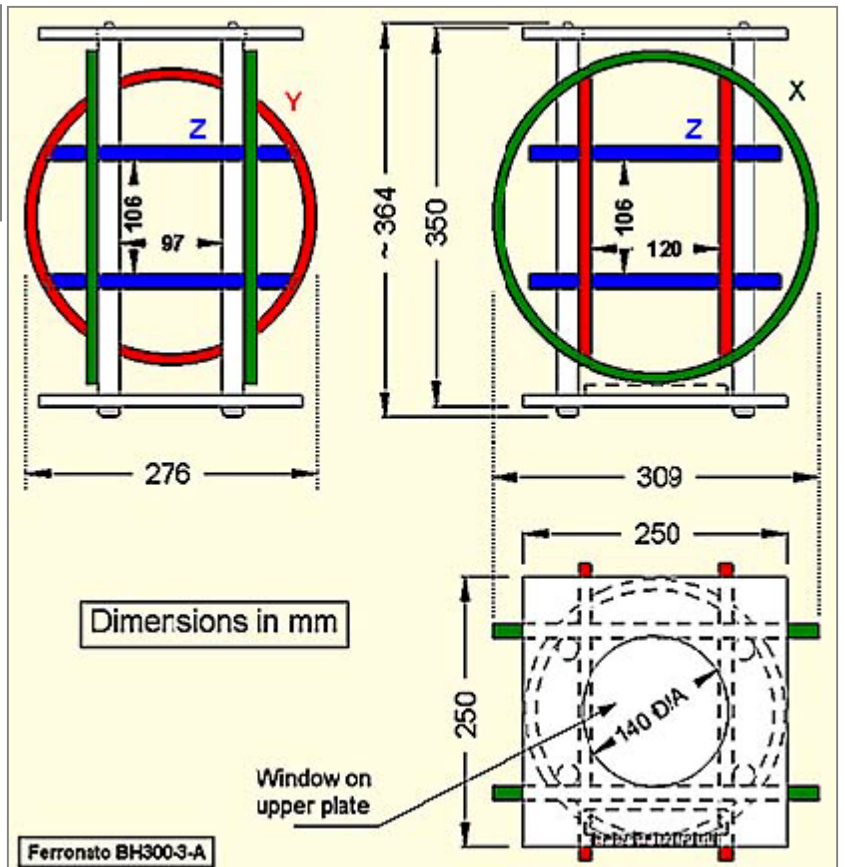
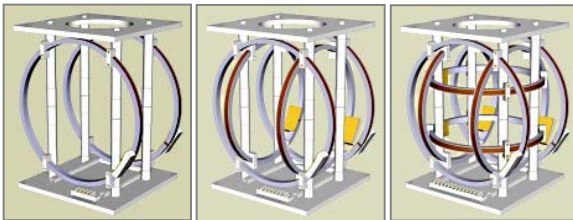


# 300 mm Helmholtz Coils

## Ferronato® - BH300-3-A

- Desktop set of three-axis Helmholtz coils for laboratory and general purposes.
- Suited for many magnetic measurements and experiments, in DC and AC.

- Same generating field ratio along each of the three axes, with a round value easy to handle: **500  $\mu\text{T/A}$**
- Accurately made, with an error smaller than  $\pm 1\%$  in the generated field.
- The coil arrangement can be modified with relative facility thanks to its simple support and its joints by screws.
- Coils on non-magnetic aluminium alloy forms.
- Each aluminium form provides a usable extra turn, with connections at the terminal block. An application example is the generation of a small magnetic field (DC or AC) to modulate the main one. Also it can be wired to generate small gradients.
- The aluminium forms also act like electrostatic screens.
- The coils can undergo heating by currents to at least  $100\text{ }^\circ\text{C}$  without damage.
- Robust construction but with a reasonable weight.
- Totally constructed with non-ferromagnetic materials.
- Excellent quality/price ratio.
- There are available versions of one and two axes, with similar characteristics:
  - **BH300-1A-A**, on one axis, horizontal, with only the X pair.
  - **BH300-1B-A**, on one axis, vertical, with only the Z pair.
  - **BH300-2A-A**, on two axes, horizontal/horizontal, with the X and Y pairs.
  - **BH300-2B-A**, on two axes, horizontal/vertical, with the X and Z pairs.



## SET SPECIFICATIONS (BH300-3-A, BH300-2A/B-A and BH300-1A/B-A)

<b>Field/Current ratio</b>	500 $\mu$ T/A (5.0 Gauss/A). For each pair, X, Y or Z. Maximum error: $\pm 1\%$ . In DC and AC.
<b>Maximum field</b>	2.0 mT (20 Gauss) in a steady way / 3.0 mT (30 Gauss) during 2 minutes. Each pair.
<b>Maximum current</b>	4.0 A in a steady mode / 6.0 A during 2 minutes (start temperature: 20 °C). Each pair.
<b>Isolation voltage</b>	250 V DC minimum, between windings and their forms and between pairs. Tested to 500 V DC.
<b>Magnetic field homogeneity</b>	Differences smaller than $\pm 1\%$ with respect to the centre, in a spherical volume of 70 mm of diameter, centred in the coils. Differences smaller than $\pm 5\%$ in a spherical volume of 100 mm of diameter. These volumes are larger on some directions.
<b>Orthogonality error</b>	$< 0.2^\circ$ , or $< 0.1^\circ$ optionally.
<b>Connection</b>	Single row, twelve positions, barrier strip terminal block, with M4 brass screws ( $\varnothing$ 4.0 mm).
<b>Max. working temp.</b>	80 °C for the set / 100 °C for the coils, as measured on its surface.
<b>Coil cross section</b>	Winding: 8.5 x 10 mm, maximum. Total (form): 10 x 13 mm
<b>Materials</b>	Enamelled copper wire windings, filled with epoxy resin. Coil forms of aluminium alloy, with internal epoxy insulation layer and connecting plates of resin/glass fibre (FR4) with PVC covers. Stand support pillars and coil brackets in Acetyl ("Delrin"), with upper and lower boards in foamed PVC. Screws in brass and Nylon.
<b>Maximum dimensions</b>	Height 364 mm x Wide 309 mm x Depth 276 mm.
<b>Weight</b>	4.5 kg for the BH300-3-A set (lower for BH300-1A/B-A and BH300-2A/B-A).
<b>Accessories</b>	Delivered with Instructions Manual in Spanish and English.
<b>Warranty</b>	Two years.

## SINGLE COIL PAIR SPECIFICATIONS

	<b>X pair (larger)</b>	<b>Y pair (medium)</b>	<b>Z pair (smaller)</b>
<b>Effective diameter</b>	300 $\pm 1$ mm	266 $\pm 1$ mm	237 $\pm 1$ mm
<b>Turns number (per coil)</b>	83	74	66
<b>DC Resistance, at 20 °C <sup>(1)</sup></b>	4.21 $\Omega$ $\pm 3\%$	3.35 $\Omega$ $\pm 3\%$	2.66 $\Omega$ $\pm 3\%$
<b>Self-inductance</b>	10.4 mH $\pm 5\%$	7.1 mH $\pm 5\%$	4.9 mH $\pm 5\%$
<b>Self-resonance Frequency</b> (With one form end connected to one coil end)	~ 25 kHz	~ 34 kHz	~ 42 kHz
<b>Secondary field generated by the forms when used as coils (Xs, Ys, Zs) <sup>(2)</sup></b>	6.0 $\mu$ T/A $\pm 3\%$	7.1 $\mu$ T/A $\pm 3\%$	7.7 $\mu$ T/A $\pm 3\%$

<sup>(1)</sup> - Resistance measured at the general connecting block. Includes wiring.

<sup>(2)</sup> - We call this constructive feature "In-Circuit Coil Forms".

Version:	BH300-3-A	BH300-2A-A	BH300-2B-A	BH300-1A-A	BH300-1B-A
Included coil pairs:	X, Y, Z	X, Y	X, Z	X	Z

- These specifications are subject to change without prior notice -

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