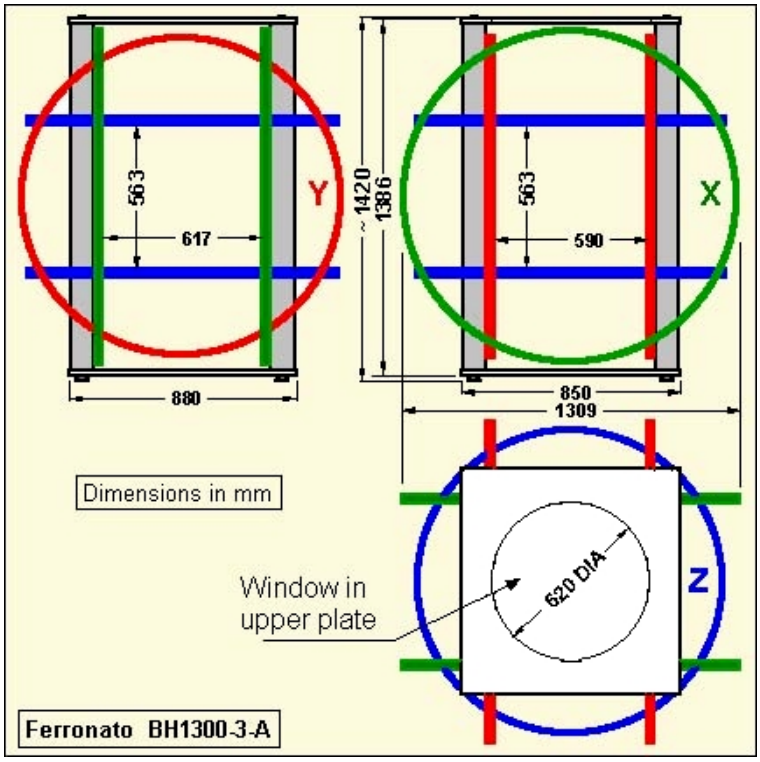
1300 mm Helmholtz Coils
Ferronato® - BH1300-3-A

--- A three-axis Helmholtz coil-set, for laboratory and general purposes.
--- Well suited for many magnetic measurements and experiments, in DC and AC.

- Same field/current ratio for the three coil pairs, with a round value easy to handle: **200 µT/A** (or 400 µT/A, or 2 x 100 µT/A, in according to wiring, easy to modify); in direct or alternate current.
- Two-wire (bifilar) winding, what allows several configurations in connections.
- Accurately made, with error smaller than ±1% in the generated field.
- Thanks to its simple supporting system and joining by screws, the coils arrangement can be modified with relative easily.
- Coils on aluminium alloy forms.
- Each aluminium form provides an usable extra turn, with wiring to the terminal block. An example of application is the generation of a small magnetic field to modulate the main one. The forms can be also configured to generate small gradients.
- The aluminium forms also act like partial shields for electric fields.
- The coils can undergo heating to at least 100ºC without damage.
- Robust construction but with a reasonably weight.
- Totally constructed with non-ferromagnetic materials.
- Excellent quality/price ratio.
- There are available versions of one or two axes, with similar characteristics:
  - ***BH1300-1A-A***, one-axis, horizontal. Only the *X* pair.
  - ***BH1300-1B-A***, one-axis, vertical. Only the *Z* pair.
  - ***BH1300-2A-A***, two-axis, horizontal/horizontal. *X* and *Y* pairs.
  - ***BH1300-2B-A***, two-axis, horizontal/vertical. *X* and *Z* pairs.



ESPECIFICATIONS OF THE BH1300-3-A SET

Field/current ratio	**200 µT/A** (2.00 Gauss/A). **For each pair, X, Y or Z**. Maximum error: ±1%. (Optionally 400 µT/A, o 2 x 100 µT/A, by modifying the wiring at the terminal block.)
Maximum field	800 µT (8.00 Gauss) in a steady way / Around 2.0 mT (20 Gauss) during 2 minutes. For each axis.
maximum current	4.0 A in a steady way / 10 A during 2 minutes (start temp: 20 ºC). Each axis.
Isolation voltage	250 V DC, minimum, between winding and form and in between windings. Tested to 500 V DC.
Magnetic field homogeneity	Differences smaller than ±1% respecting to the centre, in a spherical volume of 404 mm in diameter, centred in the coils. Differences smaller than ±5% in a spherical volume of 586 mm in diameter. The volumes to ±1% and ±5% are larger along some directions.
Orthogonality error	±0.2º, maximum.
Connection	Two terminal blocks, one for the coils and another for the forms, with M4 screws (Ø4 mm).
Max. working temp.	80 ºC for the set / 100 ºC for the coils, as measured on its surface.
Coil cross-section	Winding: 27 x 13 mm, maximum. Total (forma): 30 x 15 mm
Materials	Enamelled copper wire winding filled with epoxy resin. Coil forms in aluminium alloy, with interior epoxy coating, with terminal boards in resin/glass fibre (FR4) with covers in PVC. Supporting pillars in polypropylene tube. Upper and lower boards in foamed PVC. Brackets in Acetyl ("Delrin"). Screws in brass and Nylon.
Maximum dimensions	Height 1,420 mm x Width 1,256 mm x Depth 1,309 mm.
Weight	77 kg for the *BH1300-3-A* coil-set. See in below the weights for all the versions.
Accessories	Delivered with Instruction Manual in English and Spanish. Assembly Instructions are included when it is supplied dismounted.
Warranty	Two years.

SPECIFICATIONS OF EACH COIL PAIR

	X pair (larger)	**Y pair** (medium)	**Z pair** (smaller)
Effective diameter	1,295 ±1 mm	1,241 ±1 mm	1,187 ±1 mm
Number of turns (standard configuration) ([1])	144	138	132
DC resistance, at 20 ºC ([2])	12.6 Ω ±3%	11.6 Ω ±3%	10.6 Ω ±3%
Self-resonance frequency ([3])	2.7 kHz ±5%	2.8 kHz ±5%	2.8 kHz ±5%
Self-inductance	160 mH ±5%	141 mH ±5%	122 mH ±5%
Secondary field generated by the forms when used as coils (Xs, Ys, Zs) ([4])	1.39 µT/A ±3%	1.45 µT/A ±3%	1.51 µT/A ±3%

([1]) - It is possible to double the number of turns of each pair by changing the wiring at the terminal block.
([2]) - Resistances measured at the general terminal block.
([3]) - Self-resonance measured with -Xs connected to -X.
([4]) - We call this constructive idea "*In-Circuit Coil Forms*".

MAIN DIFFERENCES AMONG VERSIONS

Version	BH1300-3-A	BH1300-2A-A	BH1300-2B-A	BH1300-1A-A	BH1300-1B-A
Included coils/pairs	X, Y, Z	X, Y	X, Z	X	Z
Weight, in kg	77	60	58	41	39
Minimum pathway width, in cm	130	130	122	90	122

- These specifications are subject to changes without prior notice -

Note about the internal transport of the coils: When the coil-sets are supplied mounted, the pathways in the building of destination should have the minimum widths shown in the table in above. When a coil-set can not be carried to its final location because some door or corridor is too narrow, it can be supplied dismounted, in which case will be attached detailed assembly instructions, in English and Spanish.

Please, do not hesitate in contact us for any enquiry

Serviciencia, S. L. Spain	E: serviciencia@serviciencia.es I : www.serviciencia.es	T: (+34) 925 536 154 F: (+34) 925 537 644

Updated: 14 Nov 2011