

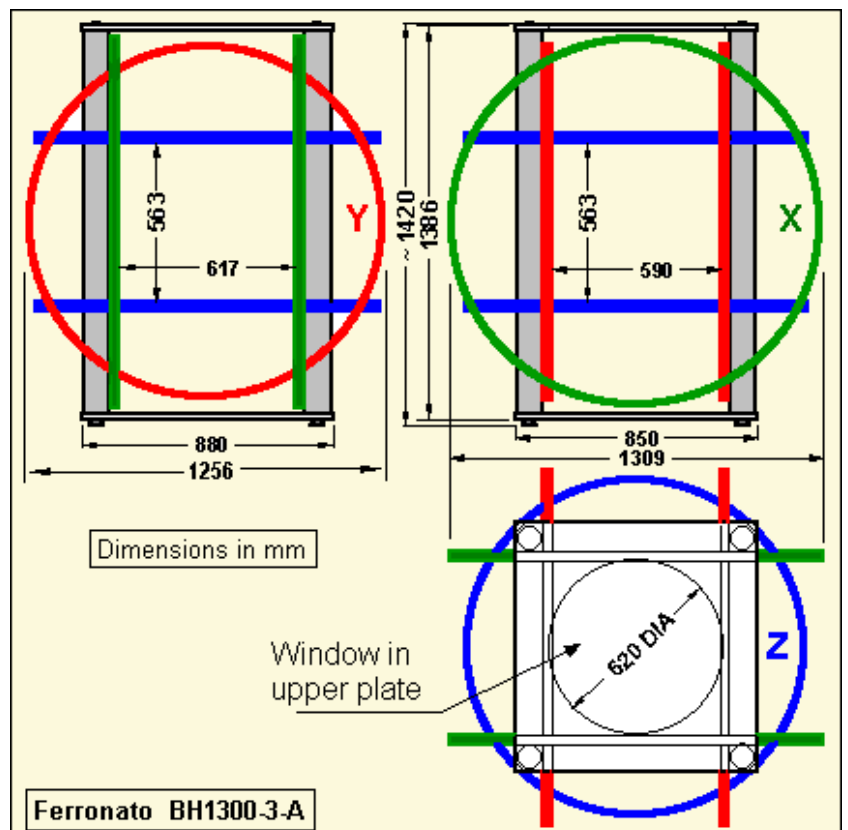
1300 mm Helmholtz Coils

Ferronato® - BH1300-3-A

--- Desktop set of three pairs of Helmholtz coils, for laboratory and general purposes.

--- Suited for many magnetic measurements and experiments, in DC and AC.

- Equal generating field ratio for the three pairs, with a round value easy to handle: **200 $\mu\text{T/A}$** (or 400 $\mu\text{T/A}$, or 2 x 100 $\mu\text{T/A}$, according to wiring).
 - Double winding (two-wire) what allows several configurations of connection.
 - Accurately made, with error smaller than $\pm 1\%$ in the generated field.
 - Thanks to its simple support and its joins by screws the coil arrangement can be modified with relative facility.
 - Coils on aluminium alloy forms.
 - Each aluminium form provides a usable extra turn, with connection in 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 heatings of until at least 100 °C without damage.
 - Robust construction but with a reasonable weight.
 - Totally constructed with non-ferromagnetic materials.
 - Excellent quality/price ratio.
 - There are versions of one and two axes available, with similar characteristics:
 - **BH1300-1A-A**, on one axis. Horizontal. Only has the X pair.
 - **BH1300-1B-A**, on one axis. Vertical. Only has the Z pair.
 - **BH1300-2A-A**, on two axis. Horizontal/horizontal. It has the X and Y pair.
 - **BH1300-2B-A**, on two axis. Horizontal/vertical. It has the X and Z pair.
- There is a page available in "PDF" format with images of these versions.



SPECIFICATIONS OF DE SET

Field/Current ratio:	200 μT/A (2.0 Gauss/A). For each pair, X, Y or Z. Maximum error: $\pm 1\%$. (optionally 400 μ T/A, or 2 x 100 μ T/A, by a wiring modification at the terminal block)
Maximum field:	800 μ T (8.0 Gauss) in permanent mode / 2.0 mT (20 Gauss) during 2 minutes. Each pair.
Maximum current:	4.0 A in steady mode / 10 A during 2 minutes (initial temperature: 20 °C). Each pair.
Isolation voltage:	250 V DC minimum, between windings and their forms and between pairs. Tested to 500 V DC.
Magnetic field homogeneity:	Differences smaller than $\pm 1\%$ with respect to the centre, in a spherical volume of 280 mm of diameter centred in the coils. Differences smaller than $\pm 5\%$ in a spherical volume of 540 mm of diameter. Volumes to 1% and 5% greater in some directions.
Connection:	Two terminal blocks, one for the coils and another for the forms, with BA4 screws (\varnothing 3,6 mm).
Maximum working temperature:	80 °C for the set / 100 °C for the coils, as measured on the forms surface.
Coil cross section:	Winding: 27 x 13 mm, maximum. Total (form): 30 x 15 mm
Materials:	Windings in enamelled copper wire, filled with epoxy resin with an intermediate layer of glass fibre. Coils forms of aluminium alloy, with internal isolating epoxy layer, with terminal plate of resin/glass fibre (FR4) with PVC covers. Stand support of PVC (rigid PVC in pillars, foamed PVC in upper and lower plates), with brackets of Acetyl ("Delrin"). Screws of brass and Nylon.
Maximum dimensions:	Height 1420 mm x Wide 1256 mm x Depth 1309 mm.
Weight:	77 kg for the BH1300-3-A coil-set. See in below a table for the weights of all the versions.
Accessories:	Delivered with Instruction Manual in Spanish and English. An Assembly Manual is included when it is delivered dismounted.
Warranty:	Two years.

SPECIFICATIONS OF EACH COILS PAIR

	X pair (large)	Y pair (medium)	Z pair (small)
Effective diameter:	1295 ± 1 mm	1241 ± 1 mm	1187 ± 1 mm
Number of turns: (1)	144	138	132
DC Resistance, at 20 °C: (2)	12.6 Ω $\pm 3\%$	11.6 Ω $\pm 3\%$	10.6 Ω $\pm 3\%$
Self-resonance: (3)	2.7 kHz $\pm 5\%$	2.8 kHz $\pm 5\%$	2.8 kHz $\pm 5\%$
Self-inductance:	160 mH $\pm 5\%$	141 mH $\pm 5\%$	122 mH $\pm 5\%$
Secondary field generated by the forms when used as coils (Xs, Ys, Zs): (4)	1.39 μ T/A $\pm 1\%$	1.45 μ T/A $\pm 1\%$	1.51 μ T/A $\pm 1\%$

(1) - Its is possible to double the number of turns by changing the wiring at the terminal block .

(2) - Resistance measured at the general connection block.

(3) - We call this constructive idea "*In-Circuit Coil Forms*".

(4) - Self-resonance measured with -Xs wired to -X.

MAIN DIFFERENCES AMONG VERSIONS

Version:	BH1300-3-A	BH1300-2A-A	BH1300-2B-A	BH1300-1A-A	BH1300-1B-A
Pairs of coils included:	X, Y, Z	X, Y	X, Z	X	Y
Weight, in kg:	77	60	58	41	39
Minimum width to get through, in cm:	130	130	122	90	122

- *These specifications are subject to change without prior notice* -

- **Note about transportation and carry-in:** When the coil-sets are delivered mounted, the way to pass through at destination must have the minimum width as shown on the table in above. When a coil-set can not be carried-in to its final place, due to some too narrow door or corridor, it can be supplied dismounted, in which case detailed assembly instructions in English and Spanish would be attached for to assemble it.

- There is a page in "PDF" format with views of the all the BH1300 versions, for 1, 2 and 3 axes. It is supplied separately.

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