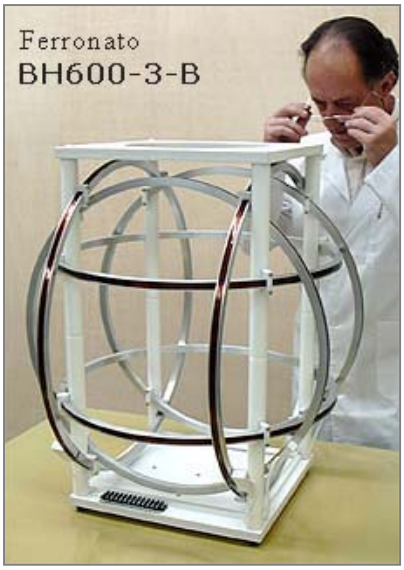
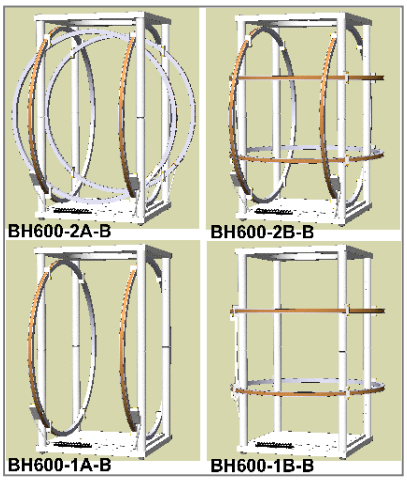
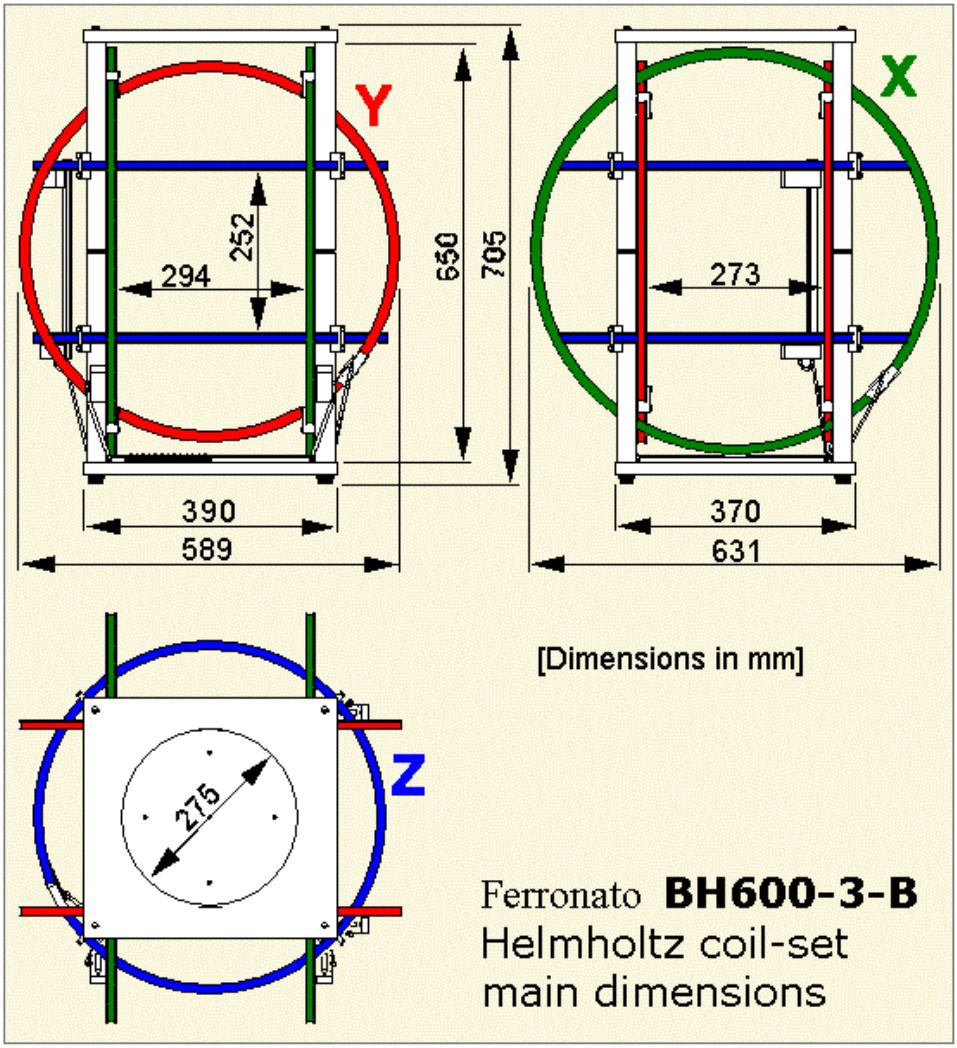
600 mm Helmholtz Coils
Ferronato® - BH600-3-B

--- 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: **300 µT/A**. In DC and AC.
- Accurately made, with an error smaller than ±1% in the generated field.
- The coil arrangement can be modified with relative facility thanks to its simple support and its joins 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 partial screens for electric fields.
- The coils can undergo heating by currents to at least 100 ºC 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.







SPECIFICATIONS OF THE BH600-3-B COIL-SET

Field current/ratio	**300 µT/A** (3.00 Gauss/A). **For each pair, X, Y or Z**. Maximum error: ±1%.
Maximum field	1.20 mT (12.0 Gauss) in steady way. Each pair. Around 2.4 mT (24 Gauss) during 2 minutes. Each pair.
Maximum current	4.0 A in steady mode / 8 A during 2 minutes (Initial temp: 20 ºC). 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 ±1% with respect to the centre, in a spherical volume of 150 mm of diameter, centred in the coils. Differences smaller than ±5% in a spherical volume of 220 mm of diameter. These volumes are larger on some directions.
Orthogonality error	± 0.2º, maximum. Optionally ± 0.1º.
Connection	Single row, twelve positions, barrier strip terminal block, with M4 brass screws (Ø 4.0 mm).
Max. working temp.	80 ºC for the whole set / 100 ºC for the coils, as measured on coil surface.
Coil cross section	Winding: 11 x 12 mm, maximum. Total (forms): 15 x 15 mm.
Materials	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.
Max. dimensions	Height 705 mm x Width 589 mm x Depth 631 mm.
Peso	15.8 kg for the *BH600-3-B coil-set*. See in below the weights for all the versions.
Accessories	Delivered with Instruction Manual in English and Spanish.
Warranty	Two years.

SPECIFICATIONS OF EACH COIL PAIR

	Par X (larger)	**Par Y** (medium)	**Par Z** (smaller)
Effective (electrical) diameter, in mm - ±1 mm	617.4	575.5	533.5
Number of turns	103	96	89
DC resistance, at 20 ºC - ±3% **(1)**	8.6 Ω	7.5 Ω	6.4 Ω
Self-resonance frequency **(2)**	about 10 kHz	about 12 kHz	about 14 kHz
Self-inductance - ±5%	38 mH	30 mH	24 mH
Secondary field generated by the aluminium forms when used as coils (Xs, Ys, Zs) - ±3% **(3)**	2.90 µT/A	3.20 µT/A	3.40 µT/A

(1) - Resistance measured at the terminal block.
(2) - Self-resonance measured with one end of the forms wired to one end of its respective coil pairs. (for example: -Xs wired to -X). If the forms are not connected (floating forms) the frequency is about twice.
(3) - We call this constructive idea "In-Circuit Coil Forms".

MAIN DIFFERENCES AMONG VERSIONS

Version	BH600-3-B	BH600-2A-B	BH600-2B-B	BH600-1A-B	BH600-1B-B
Included coil pairs	X, Y, Z	X, Y	X, Z	X	Z
Weight, in kg	15.8	13.4	13.0	10.3	9.5

- These specifications are subject to change without prior notice -

Please, do not hesitate in asking us

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