



USER'S MANUAL

MODEL: 5452

UNIFORM FIELD ELECTROMAGNET

Date Sold: _____

Serial number: _____

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TABLE OF CONTENTS

SPECIFICATIONS	5452	Section 1
WARNINGS	[Refer to this section before operation of Electromagnet]	Section 2
INSTALLATION		Section 3
Siting Considerations		
Cooling		
EXCITATION CURVES		Section 4
TEST DATA		Section 5
DRAWINGS		Section 6
Drawing 11900520 Uniform Field Electromagnet General Assembly		

Section 1
MODEL 5452 SPECIFICATIONS

Coil Inside Diameter	160mm
Coil Length	122mm
Coil resistance, series connection (20°C)	1.7 Ohm
Maximum coil resistance (hot)*	2.0 Ohm
Maximum electrical ratings (peak)	3.5A/250V/25W
Self Inductance	8mH
Calibration factor (field versus current)	approx 1mT/A
Dimensions	Drawing 11900520 122mm L x 270mm W x 270mm H (4.8inch L x 10.6inch W x 10.6inch H)
Mass	6kg (13 lb)

***CAUTION - The value of maximum coil resistance given should not be exceeded. At this resistance the coils are at maximum safe temperature for continuous operation.**

Section 2

WARNINGS

REFER TO WARNINGS BELOW BEFORE OPERATING ELECTROMAGNET

1 Personnel Safety

In operation the magnet fringing field can be in excess of 0.5mT(5G). This can cause malfunctioning of heart pacemakers and other medical implants. We recommend that the fringing field should be mapped and warning signs be placed outside the 0.5mT (5G) contour. Entry to this region of higher field should be restricted to qualified personnel.

2 Coil Hot Resistance

Do not exceed the maximum coil hot resistance of 2.0 Ohm given in the specifications or coil overheating and possible damage may occur. Under dc or ac operating conditions the electrical power delivered to the Electromagnet should not exceed 3.5A current or 25W total power. With ac excitation the maximum voltage should not exceed 250V.

3 Watches, Credit Cards, and Magnetic Disks

Do not move magnetically sensitive items into the close vicinity of the magnet. Credit cards, and magnetic disks are affected by magnetic fields as low as 0.5mT (5G).

4 Electrical Connections

Current Connection (at the back of magnet, refer to Drawing 11900520)

BNC Connector Center	Positive
BNC Connector Shield	Negative

With this polarity the magnetic field is from left to right when viewed from the front as shown in the Drawing.

CAUTION - To generate ac fields the peak voltage may be up to $\pm 250V$. Do not exceed this voltage to avoid damage to the connector, fuse or coils. Higher voltages may expose the operator to electrical shock.

The electromagnet is protected from operation at excessive current by a 3A Slow Blow Fuse, F1. Do not use a higher current rating fuse. Higher currents will overheat the coils causing failure and a safety/fire hazard.

Section 3

INSTALLATION

Siting Considerations

The Model 5452 has no magnetic shielding. Magnetic material in the vicinity of the magnet will modify the magnitude and uniformity of the central region magnetic field. As a general rule avoid magnetic material closer than approximately 1m to the central region.

Background fields such as the geomagnetic field and alternating fields from 50/60Hz power sources are unshielded by the magnet and will add vectorially to the field produced by the magnet. If possible these background fields should be measured and their effects evaluated before the Model 5452 magnet is installed. It may be necessary to orient the Model 5452 axis to minimize the effects of external fields, to resite ac power sources or to install suitable magnetic shielding.

Electrical Circuit

The magnet has two coils which are connected in series (refer to drawing 11900520). The power supply cable should be connected directly to the BNC connector marked "Input."

Never connect or remove the power cable from the magnet with the power supply connected. With ac excitation at higher voltages, arcing may result causing injury to personnel or damage to equipment.

Cooling

The Model 5452 can be operated to an average coil temperature of 70°C. Assuming an ambient laboratory temperature of 20°C and a temperature coefficient of resistivity for copper of 0.0039/°C, the hot resistance of the coil should not exceed 20% more than the ambient temperature "cold" resistance.

Section 4

OPERATION

Section 5

MAINTENANCE

Section 6

STANDARD OPTIONS

Section 7

CUSTOM OPTIONS

Section 8

EXCITATION CURVES

Section 9

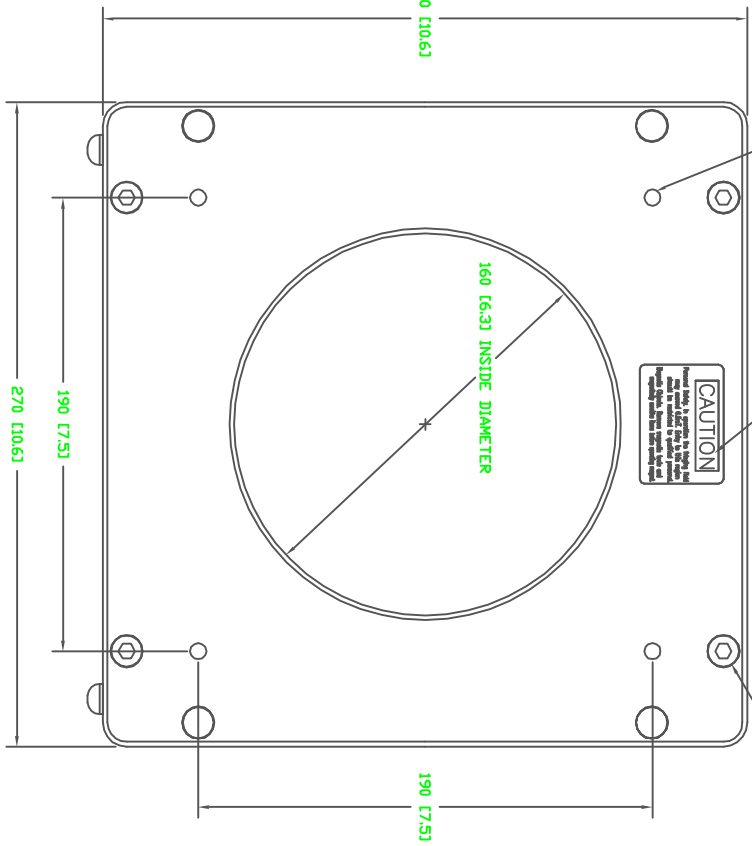
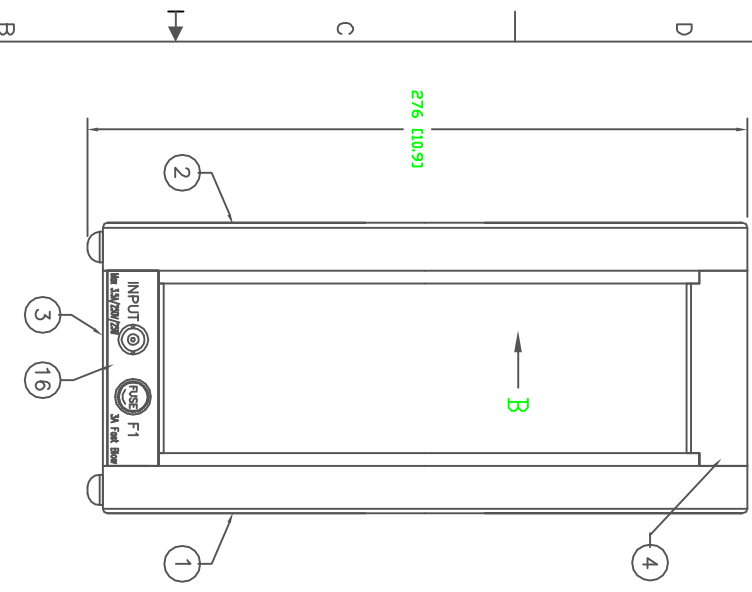
TEST DATA

Section 10

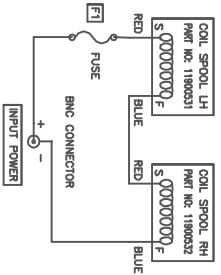
DRAWINGS

PROPRIETARY
 This drawing is the property of GMW and is not to be distributed, copied, or reproduced in any form without the written approval of GMW. All dimensions are in millimeters unless otherwise specified.

MAGNET MOUNTING HOLES M8 (Ø8 PLS)



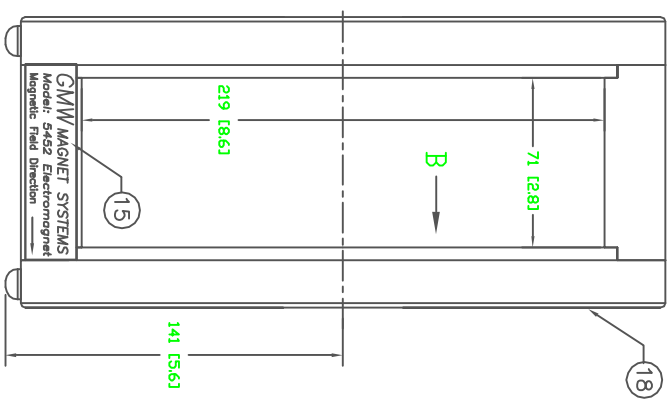
MAGNET SCHEMATIC



MAGNET SPECIFICATIONS

- MAGNET FIELD: Ⓞ FULL POWER 3mT (30 gauss)
- MAGNET APERTURE: 160mm ID
- MAGNET LENGTH: 122mm (4.8 inch)
- COILS: (series connected)
- COILS RESISTANCE (20°C) 1.7 OHM
- MAX RESISTANCE (HOT) 2.0 OHM
- CURRENT MAX: 3.5A @ 20°C AMBIENT
- VOLTAGE MAX: 250V
- POWER MAX: 25W CONTINUOUS
- INDUCTANCE: 2.6mH
- UNIFORMITY: 3000ppm OVER CENTRAL 30mm DIA SPHERE
- CALIBRATION: 1mT/A
- MASS: 6KG [13 lbs]

REV	DESCRIPTION	INVT	DATE	APPROVD
A	RELEASE		06/07/09	G.DONIGLAS
B	UPDATE SPECIFICATIONS		03/22/09	G.DONIGLAS



ITEM	QTY	PART NUMBER	DESCRIPTION
18	1	10900030	LABEL, SPECIFICATION
17	1	10900040	LABEL, CAUTION
16	1	10900050	LABEL, FRONT, BOTTOM
15	1	10900060	LABEL, REAR, BOTTOM
14	1		NUT, 3/8-32 UNF
13	1		SOLDER LUG, 9.5MM (3/8)
12	4	1062	SCREW, M3X10, PAN SL/HD PLASTIC, BOSSARD
11	4	1066	SCREW, M3X6 FLAT SL/HD PLASTIC, BOSSARD
10	8	1057	SHCS, M8X30 PLASTIC, BOSSARD
9	4	REC-207	FEET, RUBBER 12 DIA x 6H
8	1	1313003	FUSELINK, 3 AMP SLO BLO, LITTELFUSE
7	1	1270-362	FUSEHOLDER 250VAC 10A, RADIO SHACK
6	1	122 BNC50.0.16	CONNECTOR, BNC, SHUNNER
5	1	17900540	COVER PLATE
4	1	17900530	TOP PLATE
3	1	17900520	BOTTOM PLATE
2	1	11900532	COIL ASSEMBLY [RH]
1	1	11900531	COIL ASSEMBLY [LH]

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UNIFORM FIELD MAG
 MODEL: 5452

DATE: 03/22/09
 DRAWING NO.: A1 11900520

SCALE: 1:1

REV: B

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1