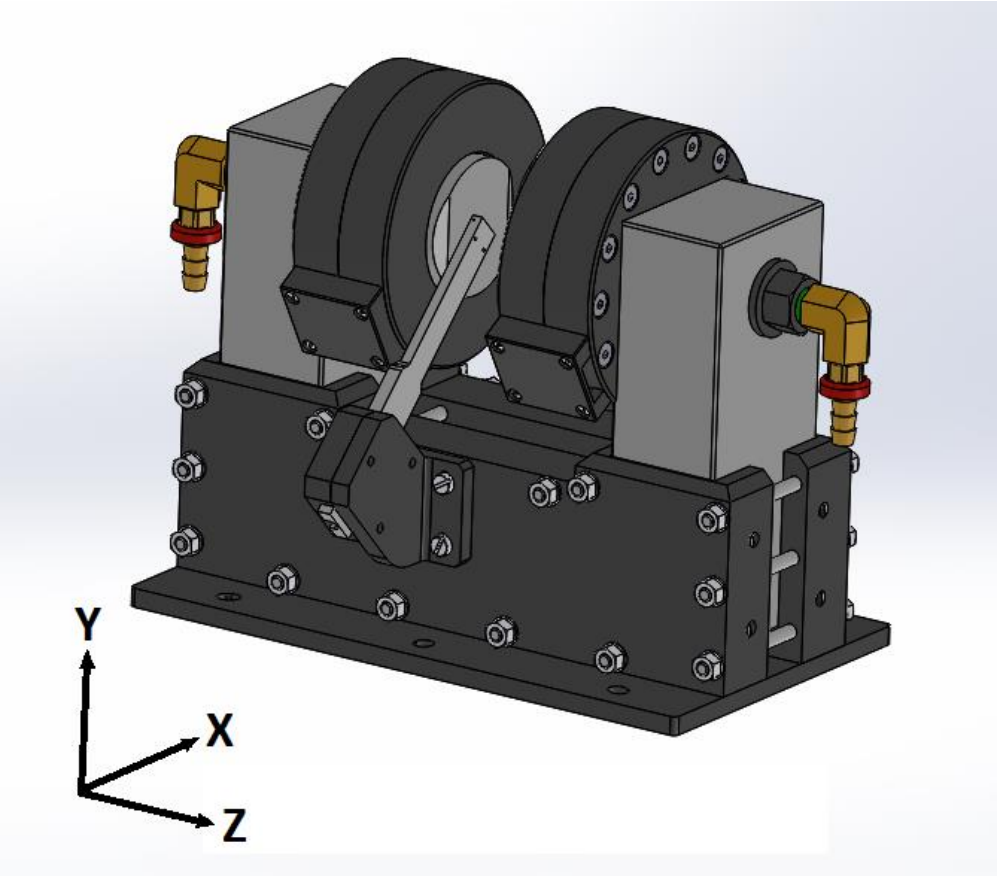
GMW

3470HFAC Dipole Electromagnet, High Frequency AC



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Technical Specification

Table 1: 3470HFAC Specifications.

Magnetic Specification	Value	Unit
Peak Field (Bz)	70	[mT]
Pole Gap	35	[mm]
Pole Face Diameter	46	[mm]
Field Uniformity (3mm x Ø20mm)	7	[%]
Max. Operating Frequency (sine wave)	25	[kHz]
Peak Excitation Current	100	[A]
Peak Excitation Voltage	680	[V]

7548 Amplifier Specifications		
Peak Current	100	[A]
Peak Voltage	170	[V]
Peak Continuous Power (RMS)	3.3	[kW]
Frequency Range	0-100	[kHz]

Single Coil (Coils connected in series or parallel depending on supply configuration)		
Conductor Type	Litz 48-6-36	[ ]
Conductor cross section Width x Thickness	12.2 x 0.71	[mm]
Turns per coil	14	[ ]
Coil DC Resistance 20°C	4.05	[mΩ]
Coil DC Resistance 60°C	4.43	[mΩ]
Coil inductance	64.8	[μH]

Power Dissipation and Thermal Properties (single coil at 20 kHz)		
Coil Power Dissipation	12.2	[W]
Power Dissipation in Complete Yoke (hysteresis)	83.2	[W]

Mechanical Properties		
Contained in volume Δx, Δy, Δz	125, 178, 212	[mm]
Mass	36.4	[kg]

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Field Profiles

The field uniformity is illustrated in Figures 1 and 2. The field perpendicular to the beam direction is the Bz field. This is shown horizontally across the sample, Figure 2, and vertically across the sample, Figure 1.

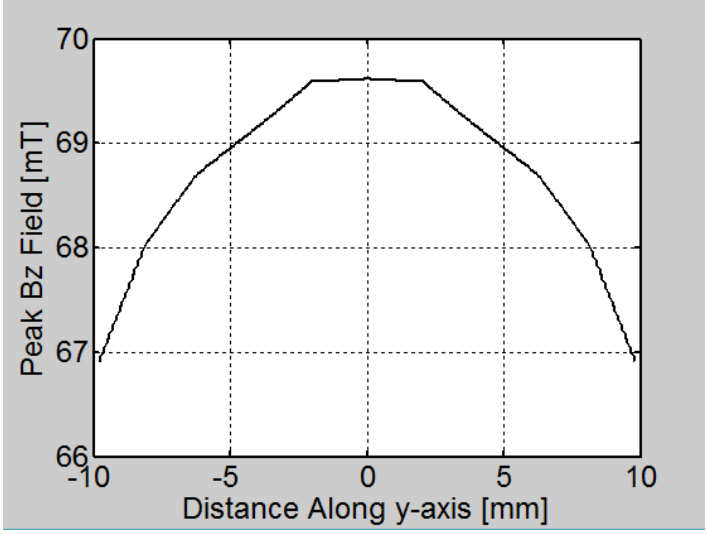

Figure 1: Peak Bz field along the y-axis at full excitation.

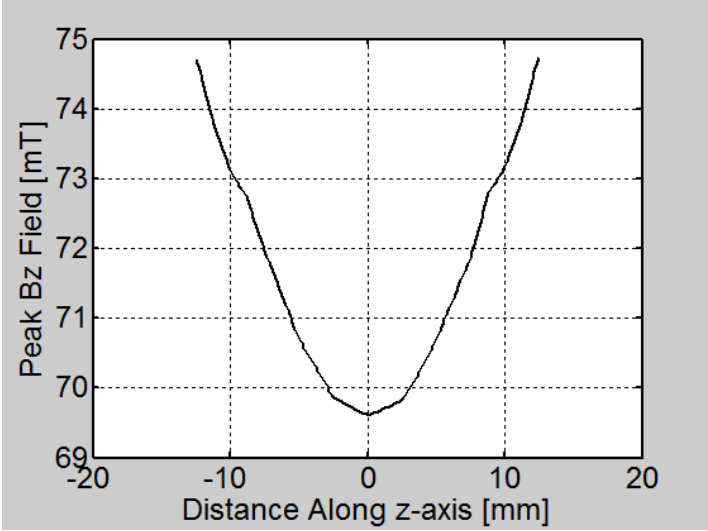

Figure 2: Peak Bz field along the z-axis at full excitation.

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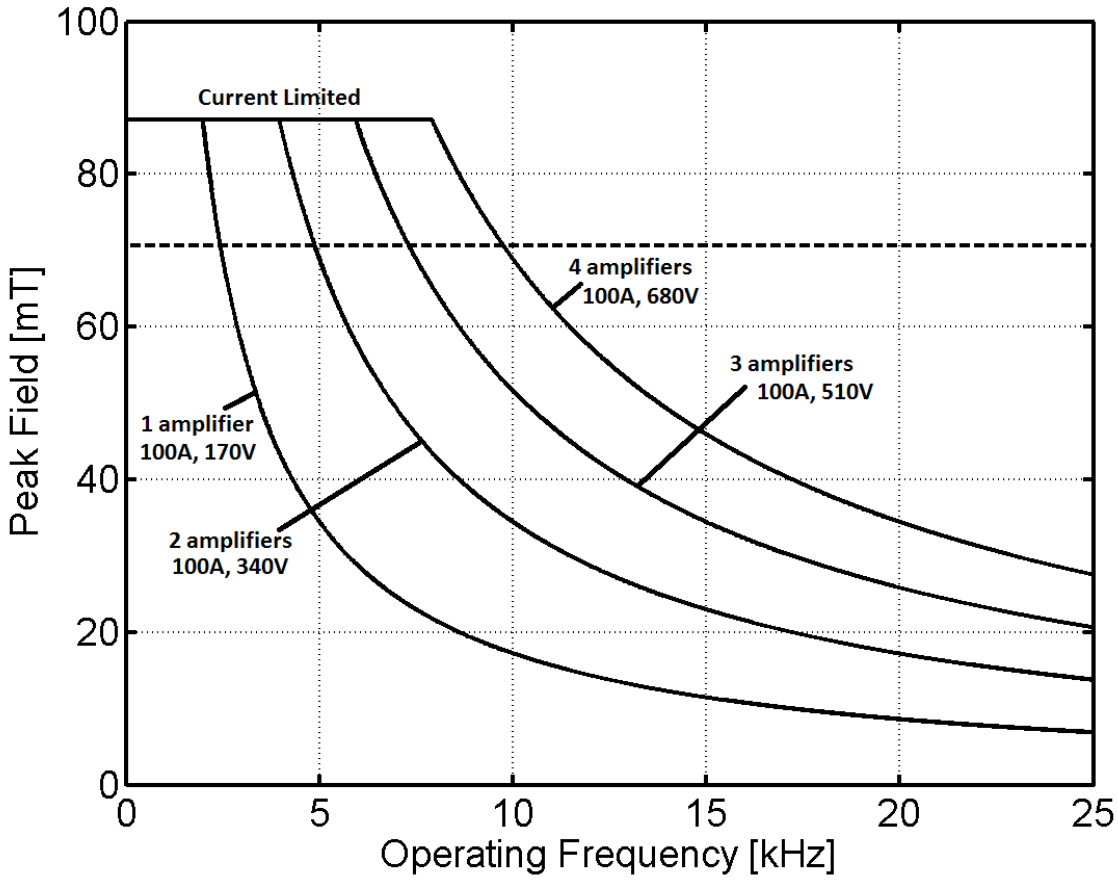

Figure 3: Field performance as a function of frequency for one through four amplifiers with a pole gap of 35mm. Coils are connected in series. The dashed line represents 70mT or 50mT$_{RMS}$. Amplifiers are connected in series.

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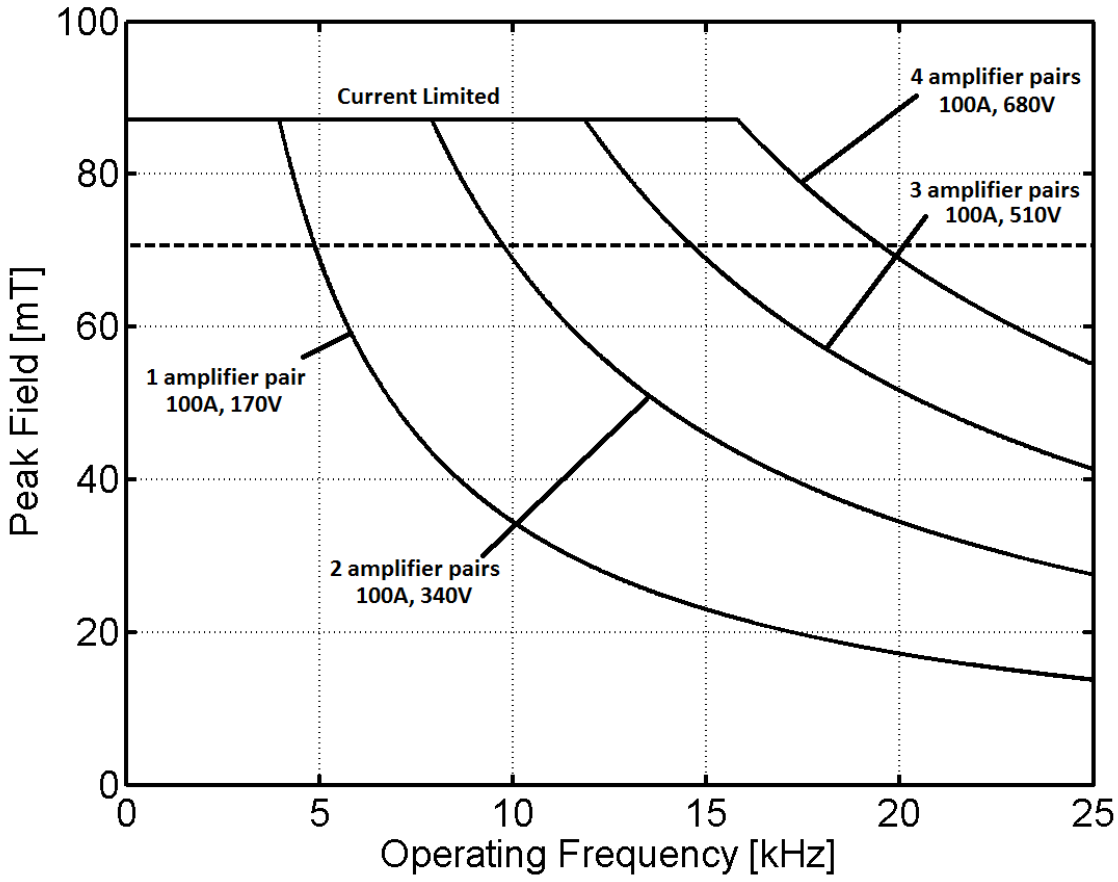

Figure 4: Field performance as a function of frequency for one through four amplifiers with a pole gap of 35mm. Coils are individually excited. The dashed line represents 70mT or 50mT$_{RMS}$. Amplifiers are connected in series.

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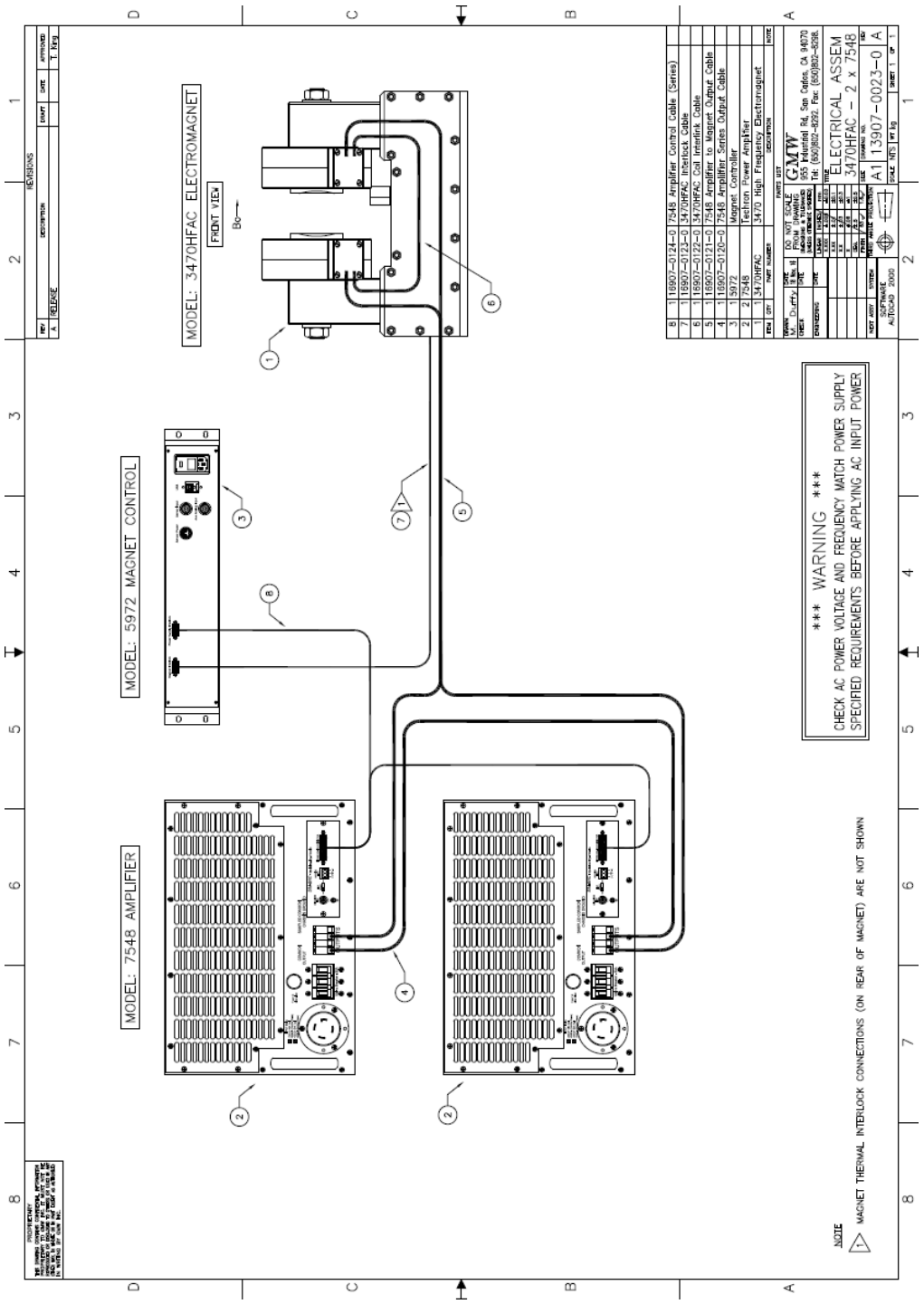

Figure 5: System diagram for two 7548 supplies in series and coils connected in series.

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