



Woodruff Scientific Inc

4000 Aurora Ave N,

Suites 5 & 6, Seattle, WA 98103

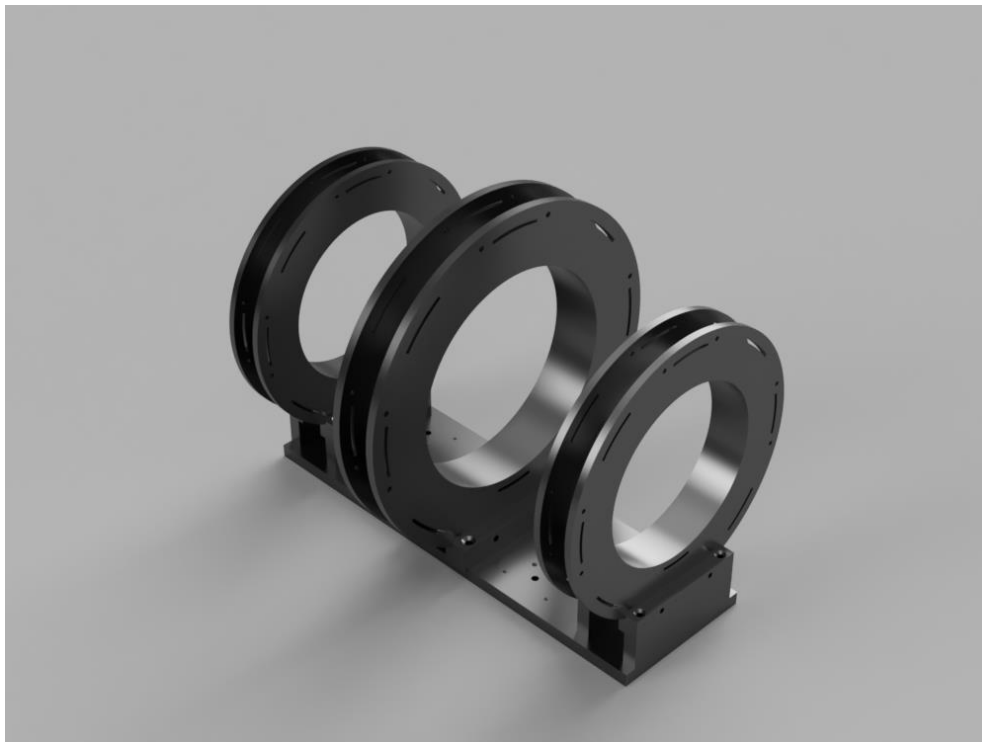
(206) 905 9477 8am to 5pm Pacific

sales@woodruffscientific.com

<http://www.woodruffscientific.com>

Model number(s): MC-UHV

Descriptive name: Maxwell Coil set, for use in Ultra High Vacuum



Features:

- Maxwell coil set mounted on Aluminum form and frame
- Custom field strength and duty-cycle options
- Designed to be used in Ultra High Vacuum
- Custom sizing, spacing and materials based on customer specifications
- Custom harnessing
- Demountable assembly allows for repositioning of coils (variable distances)

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Operational ratings:

Temperature: $\leq 150\text{C}$ (set by polyimide coating on wires)

Field strength: $\leq 10\text{ T}$ (set by fuse limit in wire)

Options:

- Additional Coils

Additional coils can be added to extend or shape the field.

- Electronics: Static / time-varying

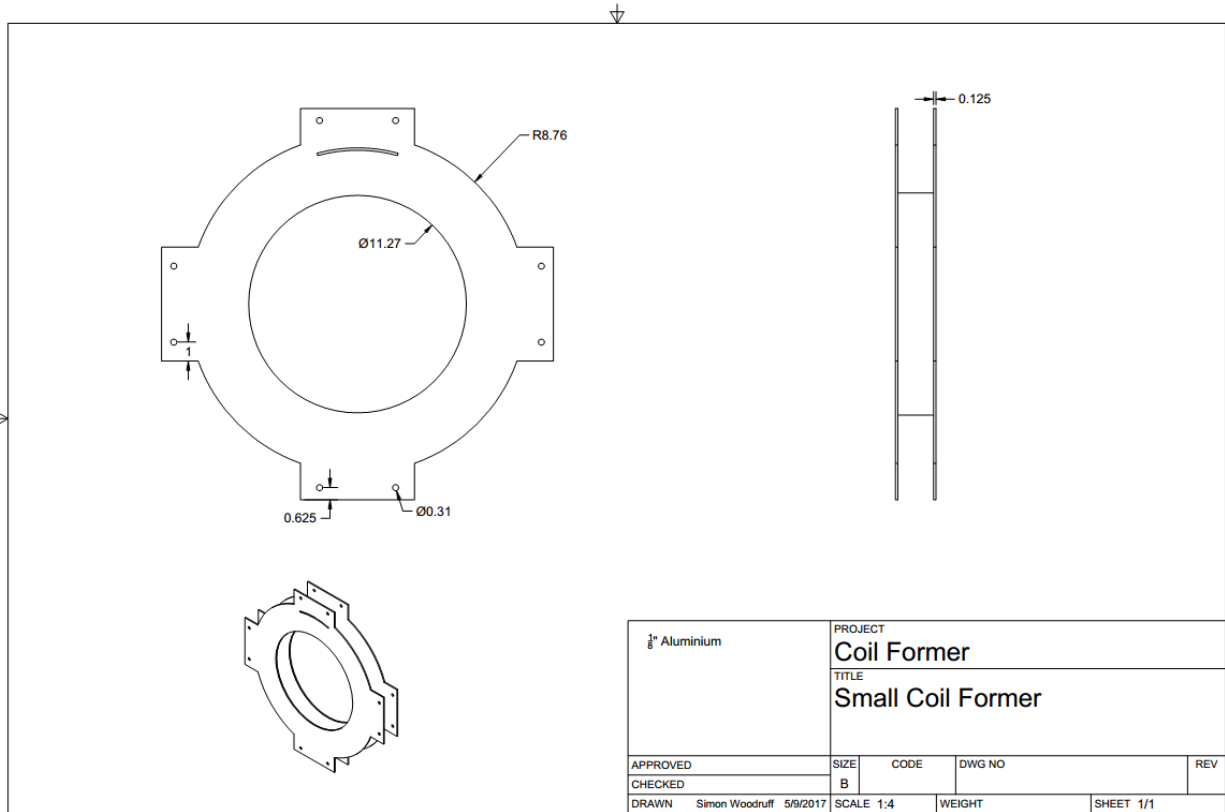
Power supplies can be provided to program waveforms of almost arbitrary functions, from continuous operation to low duty-cycle operations. Computer control can be provided as well as thermal monitoring.



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Engineering drawing:

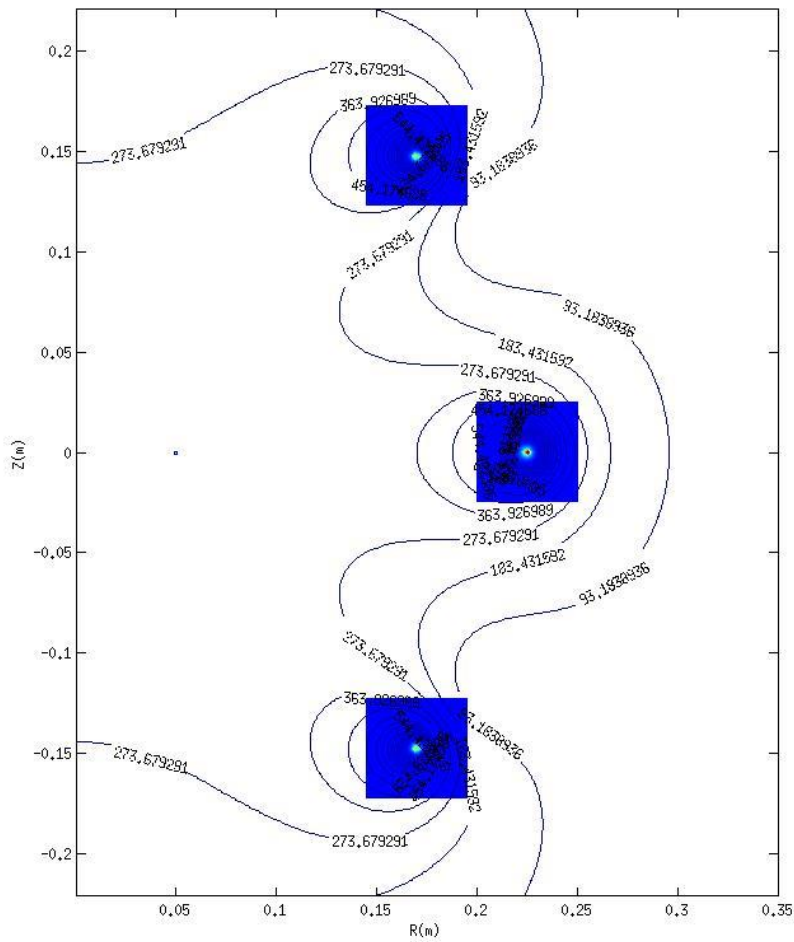


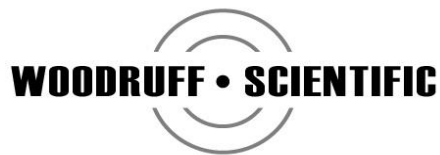


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Flux plots





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Thermal analysis

Single Pulse HH

Coil current,	$I = 12.50 \text{ A}$
Coil radius,	$r = 0.10 \text{ m}$
Turns per coil,	$n = 225.00$
Max B,	$B = 0.02 \text{ T}$
Max B,	$B = 241.50 \text{ G}$
Radius of wire,	$r_w = 0.08 \text{ cm}$
Time,	$t = 3.60\text{e}+03 \text{ s}$
Length of wire,	$L_w = 282.69 \text{ m}$
Resistance,	$R = 2.34 \text{ Ohms}$
Ohmic heating,	$E = 1316628.68 \text{ J}$
Volume of Wire,	$V_w = 568.38 \text{ cm}^3$
Mass of Wire,	$M_w = 4888.08 \text{ g}$
Temp. change,	$dT = 699.62 \text{ C}$

Multi-Pulse HH

Duty cycle,	$\text{duty} = 1.00\text{e}+00$
Cooling power,	$P*\text{duty} = 365.73 \text{ W}$

Table 1. Thermal analysis (assuming no heat conduction).

Customization:

In addition to the options listed previously, the Maxwell coil can be customized in many different ways. For example, if the application is for pulsed operation with timescales short relative to the resistive diffusion time through the coil form, then an insulating break can be provided in the coil form itself. Other customizations can include form materials selection, wire selection, harnessing, shroud, orientation (two axis systems) and so forth.