



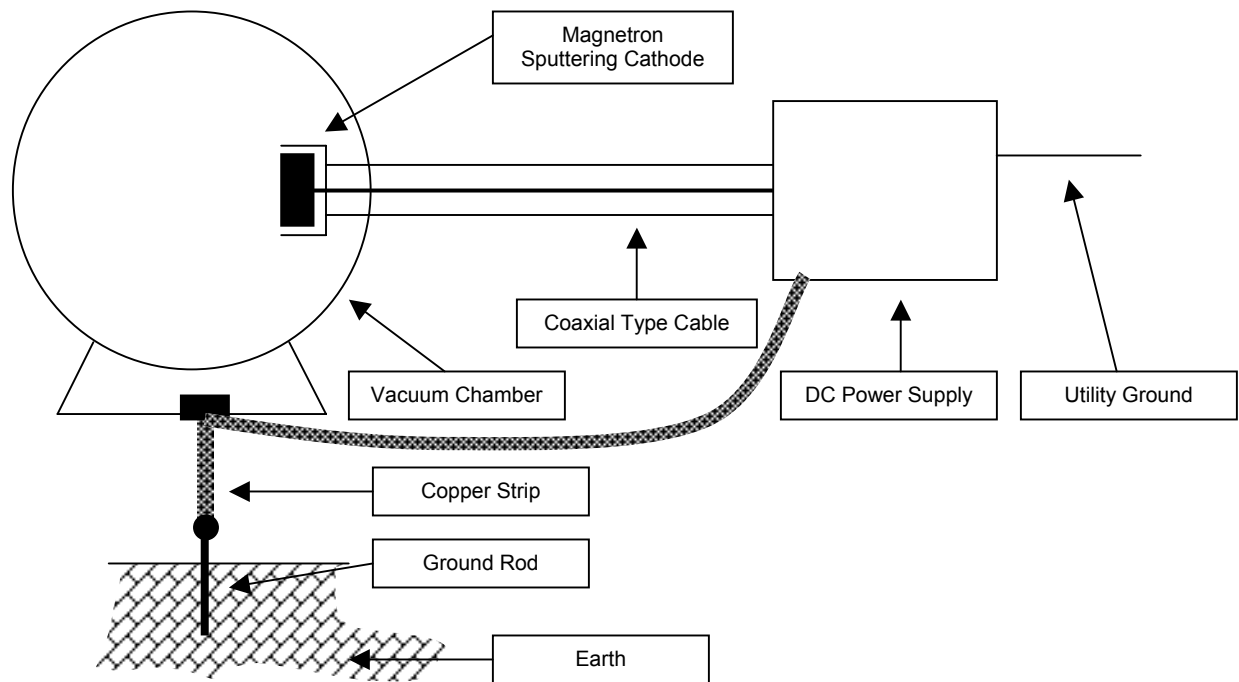
High-powered solutions for RF and microwave applications

## Application Note: Grounding of High Power DC Sputtering Power Systems

Proper grounding of single or multiple DC power supplies in a sputtering system is important as proper ground connections will enable reliable operation of the hardware in addition to managed occurrences of plasma process arcing. The power supply's ability to maintain the control of a dynamic plasma process is based on a stable low resistance current return path (back to the power supply) and isolation of process generated noise from the control cables.

The typical vacuum process system (sputtering, glow discharge, or e-beam evaporation) uses a wide copper strip (~4" to 6" wide X .032" thick) as a primary ground to connect the vacuum chamber body to a single or an array of ground rods. The copper strip is also used to connect each power supply chassis to the chamber grounding point. Note that these low impedance **functional** ground conductors are in addition to any required utility specified **safety** ground connections.

To ensure a proper power transfer and return path for the power supply's output, we recommend the use of specially designed high voltage coaxial cables. Manitou Systems can recommend the proper cable for your application.



### **Manitou Systems, Inc.**

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Tel.203.792.8797 Fax.203.792.7097  
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## Copper Strip Specifications

- CA110 or 110 Electrolytic Tough Pitch Copper - has the highest degree of electrical conductivity of any metal except silver.
- High ductility makes it a good choice for drawing, forming & spinning operations.
- It can be cold-worked or hot-formed & has highly suitable characteristics for welding & soldering.
- Corrosion resistance is excellent.
- Conforms to ASTM spec. B133(HO4) & B187.
- Available in an inch thickness of .027, .032, .040, .062 and .125

We recommend .032" for power levels of up to 150 kW of output power.

- The following source has both small and large quantities available:

METAL & CABLE CORP., INC.  
9337 RAVENNA RD., UNIT C P.O. BOX 117  
TWINSBURG, OH 44087  
PHONE (330) 425-8455  
FAX (330) 963-7246  
E-mail [david@metal-cable.com](mailto:david@metal-cable.com)

## Installation

- The copper strip should be physically fastened to the ground rod(s) using a fabricated copper clamp. Typical anti corrosive compound should be used in between the surfaces. This chemical is available at a local electrical supply house.
- The opposite end is fastened to the vacuum chamber using a clamp bar fastened to a welded flange or bracket.
- This un-insulated strip assembly is typically positioned along the floor and may be fastened to the floor using fabricated insulating material.
- Dress this conductor away from all high traffic areas. It may also be protected from physical damage by covering it.
- Remember to use an approved and grounded shorting stick during service procedures.

Please contact Manitou Systems Inc. with any additional technical questions or comments.

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