

RF/DC ION FUNNEL

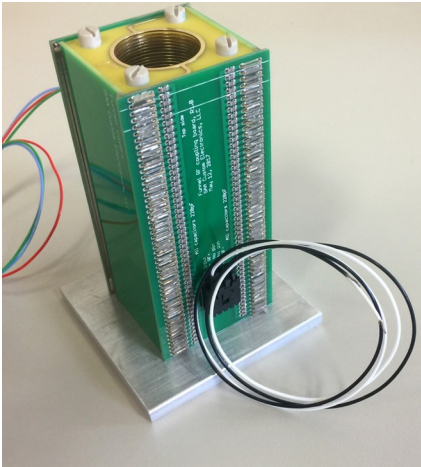
User Manual & Specifications

Revision 1.0 | www.GAAcustom.com | gaa@gaa-ce.com | 509.628.6851

1. Overview

The GAACE RF/DC Ion Funnel is a PCB-based ion funnel for focusing and transporting ions from a higher-pressure region into vacuum. A stack of gold-plated ring electrodes is driven with an RF confinement field superimposed on a linear DC axial gradient, radially confining ions while pushing them toward the exit orifice — substantially improving ion transmission compared to a simple orifice or skimmer.

The funnel is built entirely from PCB ring electrodes, making it robust, inexpensive to reproduce, and easy to clean — the entire assembly can be cleaned in a sonicator without special handling.



2. Key Specifications

Overall Length	4.3" (standard) — custom lengths built to order
Entrance Aperture	1.0"
Exit Orifice	0.1"
Plate Spacing	0.04"
Plate Thickness	0.02"
Plate Finish	Gold plated
Capacitance	~700 pF (typical, standard length)
DC Gradient	Linear, axial
Drive Requirement	RF + linear DC gradient
Cleaning	Sonicator-safe

3. Electrical Connections

Two connectors are provided on the funnel assembly — one for the RF drive and one for the DC gradient and conductance-limit connections:

RF Connector — RF+	White
RF Connector — RF-	Black
DC Connector — DC Top	Red
DC Connector — DC Bottom	Blue
DC Connector — Conductance Limit	Green

4. Mounting & Installation

The funnel mounts to a vacuum flange or mounting plate using four 0.25" diameter attachment rods, 4.1" long. Each rod has a 4-40 threaded insert on one end and a 0.05" set screw at the top end (driver included). The mounting plate provides 4-40 tapped holes and an O-ring groove for the vacuum seal; fiber washers are included to limit O-ring compression.

- Install the four attachment rods into the mounting plate finger-tight — do not overtighten.
- Confirm all four set screws are perfectly aligned and perpendicular to the mounting surface before installing the funnel.
- Carefully position the funnel assembly onto the four rods, then install and snug the top attachment — finger-tight is sufficient.

NOTE: Overtightening the attachment rods or set screws can distort the plate stack alignment and degrade transmission performance.

5. Custom Configurations

The standard funnel is 4.3" overall length with a 1" entrance aperture, but the plate-stack design allows the funnel to be built to any length required for your application. Contact GAA Custom Electronics to discuss custom entrance apertures, exit orifice sizes, or overall lengths for your instrument.

6. Compatible RF Drivers

The funnel's RF confinement field and linear DC gradient are designed to be driven by GAACE RF driver instruments — the RF Generator or RF Mega — both of which supply the RF drive and DC bias needed to operate the funnel directly, without additional external hardware.