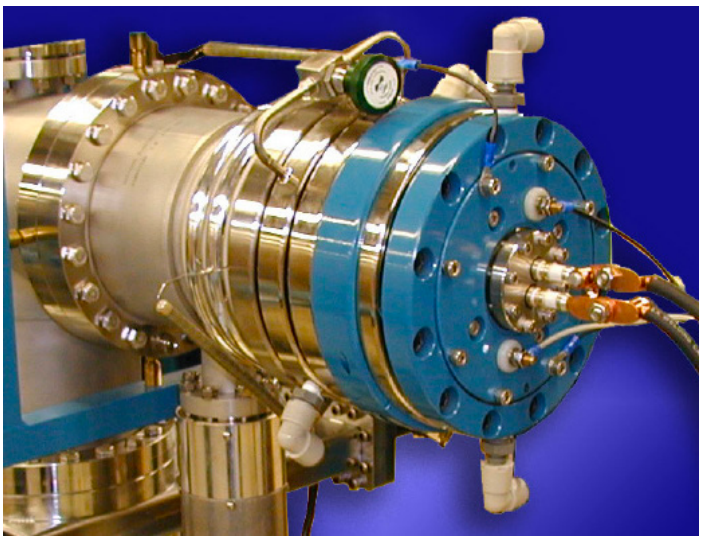
POSITIVE ION SOURCES
National Electrostatics Corp.

Positive Duoplasmatron Ion Source

APPLICATIONS

The NEC positive duoplasmatron ion source is designed primarily to produce H^+, He^+ O^+ and Ar^+ beams. However, it is usable for most gases that form stable positive ions. This ion source has been supplied with NEC's open air systems up to 200kV and pressurized Pelletron® accelerators up to 20 MV.



Positive Ion Duoplasmatron Ion Source with extractor assembly.

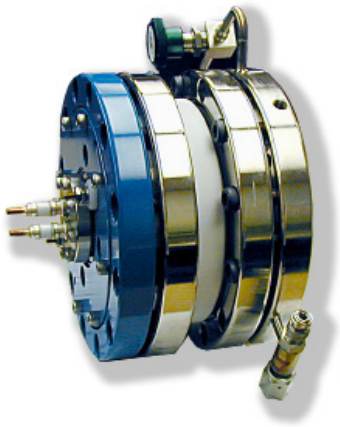
DESIGN

The NEC positive duoplasmatron ion source is of all metal and ceramic construction and utilizes metal gaskets to provide vacuum seals. It has proven to be reliable with simple routine operation.

The source is provided with an anode aperture bypass valve, liquid cooling connection, and source magnet with electrical feedthroughs. Clamps are provided on two (2) 50A feedthroughs to hold either tungsten wire or coated mesh filaments. The feedthroughs are welded to the filament holder flange.

PERFORMANCE

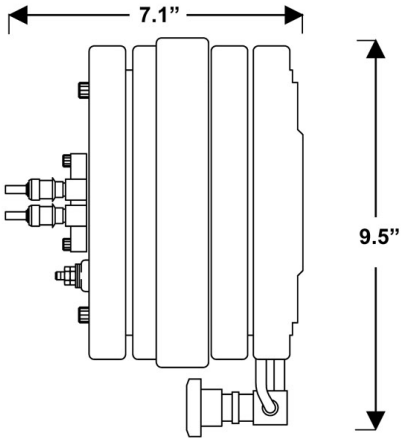
Beams of He^+, O^+, and Ar^+ are routinely produced with currents on the order of 2 to 2.5 mA when arc and extractor voltages of about 100 V and 30 kV DC respectively are used. Beams of H^+ up to 10 mA can be expected.

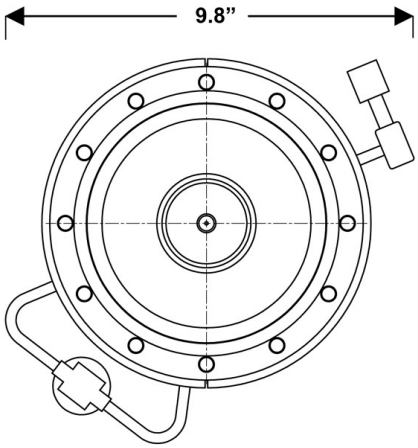


Positive Ion Duoplasmatron Ion Source

SPECIFICATIONS

Physical Dimensions:	Overall Length 7.1 ” (180 mm) Overall Diameter 8” (203 mm)
Vacuum:	Pump out bypass valve provided across anode aperture assembly
Gas Flow:	About 10 atm cc/hr
Anode Aperature:	0.025” standard, beam output proportional to area
Filament:	0.035” uncoated tungsten filament, lifetime between 75 and 100 hours. For highest current, an oxide surface emitter is recommended.
Beam Emittance (rr’E1/2):	7 πmm mR $(MeV)^{½}$ for H^{+} (typical)
Cooling:	LOBS or deionized water continuous flow, input temperature 10°C, pressure drop less than 20 psi, 0.5 gallon/minute (1.9 liter/minute)





Contact NEC

www.pelletron.com +1 (608) 831-7600 nec@pelletron.com

7540 Graber Rd, Middleton, WI 53562-0310 USA