

COLD CATHODE PENNING ION SOURCE

Model SO-60



Features

- High yield of multiply charged ions
- Low power consumption
- Long lifetime
- Low beam emittance
- Beam currents in the range of
10 - 150 μA for singly charged ions
1 - 15 μA for doubly charged ions
- Easy operation and maintenance

General description

The Model SO-60 cold cathode penning ion source is the HVEE version of the Frankfurt PIG ion source. The SO-60 ion source combines simplicity, low power consumption and long lifetime with a high yield of multiply charged ions. This makes the SO-60 ion source ideally suited for research applications in which a large variety of multiply charged ions are required on a routine basis.

The SO-60 ion source has been designed in such geometry that a low pressure plasma can easily be maintained without a hot filament.

The ionization chamber consists basically of an anode cylinder and two cathode rings facing both ends of the anode. By means of a relatively high discharge voltage and an axial magnetic field, a plasma is created from which the ions are extracted through one of the cathode rings.

This high discharge voltage and the low operating pressure make the SO-60 ion source especially suited for the production of multiply charged ions from gases.

Spare parts to cover the first needs are included with each SO-60 ion source.

Other types of penning ion sources available from High Voltage Engineering are:
The Model SO-90 Sputter Penning Ion Source for sputtering of solid materials
The Model SO-100 Hot Cathode Penning ion source

HIGH VOLTAGE ENGINEERING

Particle Accelerators Systems for the scientific, educational and industrial research communities



HIGH VOLTAGE ENGINEERING EUROPA B.V.

Amsterdamseweg 63, 3812 RR Amersfoort, P.O. Box 99, 3800 AB Amersfoort, The Netherlands
Phone: +31 33 4619741 Fax: +31 33 4615291 E-mail: info@highvolteng.com Web: www.highvolteng.com



SPECIFICATIONS

. Typical beam currents as measured on the target of a 400 or 500 kV HVEE ion implantation system for energies between 80 - 400/500 keV and with 30 kV extraction voltage

Ion	Current (μA)	Ion	Current (μA)
$^1\text{H}^+$	10	$^{40}\text{Ar}^+$	150
$^2\text{H}_2^+$	100	$^{40}\text{Ar}^{2+}$	15
$^4\text{He}^+$	150	$^{40}\text{Ar}^{5+}$	50 nA
$^4\text{He}^{2+}$	2	$^{84}\text{Kr}^+$	70
$^{12}\text{C}^+$	25	$^{84}\text{Kr}^{2+}$	8
$^{12}\text{C}^{2+}$	1	$^{84}\text{Kr}^{6+}$	50 nA
$^{14}\text{N}^+$	80	$^{129}\text{Xe}^+$	20
$^{14}\text{N}^{2+}$	2	$^{129}\text{Xe}^{2+}$	5
$^{16}\text{O}^+$	65	$^{129}\text{Xe}^{6+}$	50 nA
$^{16}\text{O}^{2+}$	3		

. Beam emittance : $< 3 \pi \text{ mm mrad (MeV)}^{1/2}$

. Energy spread : approx. 60 eV

POWER REQUIREMENTS

Anode power supply : 10 kV / 10 mA DC
Magnet power supply : 10 V / 30 A DC
Extraction power supply : 20 - 30 kV / 5mA DC
Cooling : 50 m³ air per hour

The Model SO-60 ion source normally operates at +/- 30 kV with respect to (terminal) ground. Therefore the source must be insulated from (terminal) ground. The source power supplies must be connected to a 30 kV isolation transformer.

Options

1. Ion source power supplies & extraction power supply.
2. Isolation flanges, standard and special designs.
3. Extraction electrode
4. Spare parts kits.

Sales offices in Europe and Japan

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