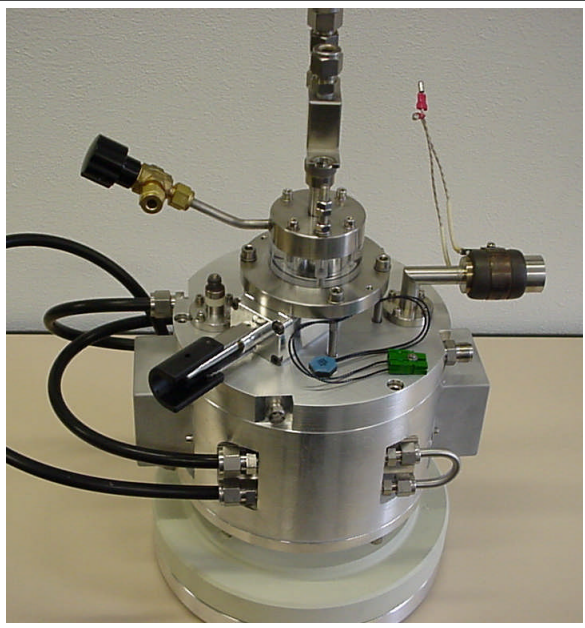


NEGATIVE SPUTTER ION SOURCE

Model 860A and 860C



Features

- Easy operation and maintenance
- High intensity ion beams of almost all elements in the periodic table
- Beam currents up to 150 μA
- Low beam emittance
- Easy cesium reservoir loading
- Lifetime cesium charge > 1000 hours
- Easy (ex)change of source materials

General description

The HVE Model 860 Negative Sputter Ion Source is a heavy ion source which produces microampere intensity negative ion beams from a wide variety of elemental materials.

The negative ions are produced by bombarding a cylindrical target of the desired beam material with positive cesium ions. Particles of target material are sputtered from the surface of the target by the cesium ions, and produce low velocity atoms which charge exchange in the neutral cesium surface layer. These secondary negative ions are repelled from the surface of the target and are accelerated to ground potential, acquiring a beam energy of about 10 - 40 keV depending on the extraction voltage. A pair of permanent magnets, installed in the source housing suppresses secondary electrons. To change ion species, the existing cathode target can be easily and quickly replaced by a new one through an in-line gate valve without breaking the vacuum.

Two types of the Model 860 Sputter Ion Source are available:

- The Model 860A, with an annular ionizer capable of producing high intensity negative ion beams over longer periods of time
- The Model 860C, with a spherical ionizer especially recommended when beams with small emittance are required for efficient transmission at low acceleration voltages or through large accelerator systems

Modification kits to change a Model 860A source into a Model 860C source are available.

HIGH VOLTAGE ENGINEERING

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



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SPECIFICATIONS

- Typical analyzed beam currents from a HVE dual leg Tandetron injection system with 20 kV extraction, 40kV pre-acceleration and 30° mass analysis

| Ion | 860A | 860C | Ion | 860A | 860C |
|--|--------|-------|--------------------------------|--------|-------|
| ¹¹ B ⁻ | 20 μA | 10 μA | ³¹ P ⁻ | 55 μA | 25 μA |
| ¹⁶ O ⁻ | 120 μA | 60 μA | ⁶³ Cu ⁻ | 40 μA | 20 μA |
| ²⁷ Al ₂ ⁻ | 50 μA | 25 μA | ⁷⁵ As ⁻ | 25 μA | 10 μA |
| ²⁸ Si ⁻ | 150 μA | 75 μA | ¹⁹⁷ Au ⁻ | 150 μA | 75 μA |

- Beam emittance 860A source : 8 - 12 π mm mrad (MeV)^{1/2}
 860C source : 2 - 6 π mm mrad (MeV)^{1/2}

POWER REQUIREMENTS

| | |
|-------------------------------|--|
| Target power supply | : -10 kV / 10 mA, DC |
| Ionizer power supply | : 15 V / 30 A, DC for 860A source 15 V / 25 A, DC for 860C source |
| Cesium reservoir power supply | : 50 V / 2 A, AC |
| Extraction power supply | : -20 kV / 5 mA, DC or -30 kV / 3 mA, DC |

The Model 860 Sputter Ion Source requires ambient temperature liquid cooling with Sylterm XLT[®] or equivalent fluids (2 l/min, resistivity > 1 MΩ/cm).

The Model 860 Sputter Ion Source normally operates at -20/-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 20/30 kV isolation transformer.

Sales offices in Europe and Japan

NSIS-5

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