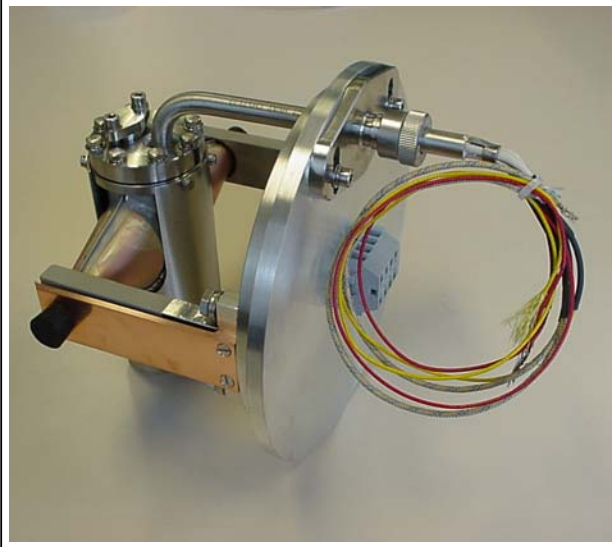


LITHIUM CHARGE EXCHANGE CANAL



Features

- High negative ion yield
- Rapid temperature response for stable beam intensity
- Operating life time ~500 hours
- Better "safety" of lithium compared to other alkali metals
- Low vapor load for vacuum system
- Sealed elbow heater with thermocouple

General description

The HVEE lithium charge exchange canal is especially designed for use with the HVEE and GENERAL IONEX Duoplasmatron- and RF-ion sources, but is equally useful for charge exchange of positive ions produced by other type of ion sources.

Negative ions for tandem accelerators that are not available by direct extraction from an ion source can be formed by converting positive ions via charge exchange in a donor canal. A well focussed, positive ion beam is directed into a small diameter canal in which a controlled lithium vapour from a reservoir is admitted at the center. Incident ions pick up electrons from a variety of scattering processes whereby a fraction emerges with a net negative charge.

The content of the reservoir is heated by a heater wire. A thermocouple measures the lithium temperature near the heater wire. The low mass of the reservoir permits rapid temperature response and, as a result, accurate control of the ion beam intensity. To minimize the migration of lithium into the vacuum system, the charge exchange canal is of the re-circulating type wherein condensing tubes are located at the entrance and exit of the canal. The vaporized lithium condenses on these tubes and flows back to the canal reservoir. This results in long operating life times and reduces the vapor load for the vacuum system.

A temperature control assembly is optionally available to control the lithium temperature. The required lithium temperature is set via a 0 - 10 V input signal. The actual temperature of the lithium is available as a digital readout at the temperature control assembly. A special compensation cable between the temperature control assembly and the thermocouples is included. A vacuum housing with minimum insertion length is optionally available.

HIGH VOLTAGE ENGINEERING

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



HIGH VOLTAGE ENGINEERING EUROPA B.V.

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SPECIFICATIONS

Charge exchange canal

Type of alkali metal	: Lithium
Entrance/exit opening	: 9.4 mm
Minimum canal diameter	: 6.4 mm
Canal length	: 140 mm
Thermocouple	: K-type, chromel-alumel
Operating temperature	: 500 - 600 °C
Operating time	: approx. 500 hours
Mounting flange	: 150.6 mm I.D. / 171.3 mm O.D
Insertion length	: 88.7 mm (low type) or 104.2 mm (high type)

Vacuum housing (optional)

Inside diameter	: 164 mm
Beam line insertion length	: 225 mm
Beam line flanges	: NW 160 ISO, others on request

Temperature control assembly (optional)

Control input	: 0 - 10 Vdc (1 V per 120 °C)
Heater output	: 75V / 3.3A or 95V / 2.6A or 110V / 2.2A
Temperature indication	: 0 - 1200 °C
Control accuracy	: +/- 2 °C
Power requirements	: 230 Vac, 50/60 Hz, 3.15 A
Dimensions	: Width for 19" rack mounting Height 132 mm, depth 305 mm

Sales offices in Europe and Japan

LCEC-4

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