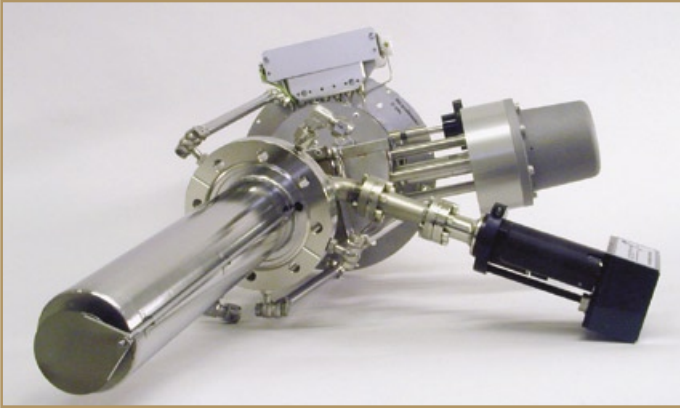


VALVED ALKALI METAL SOURCE AKS



AKS 63-150-S, alkali metal source with 150 cm³ reservoir, integrated water-cooled injector and shutter

The Valved Alkali Metal Source AKS is designed for evaporation of elemental high vapor pressure alkali metals like cesium (Cs) and rubidium (Rb) in standard MBE or UHV systems.

The AKS provides precise metal flux stability of better $\pm 0.1\%$ by $\pm 0.03\text{K}$ temperature control of the metal reservoir using external heating.

The integrated pneumatic all metal valve enables rapid on/off switching of the atomic beam. Its vacuum tight construction allows venting the MBE system without breaking the vacuum inside the AKS evaporator.

The AKS consists of the 150 cm³ reservoir, precisely heated by a closed cycle heating thermostat, the heated valve and the heated injector unit which acts as interface to the UHV system. Both components, valve and injector, are independently heated electrically to avoid material condensation. An additional rotary shutter is available on request.

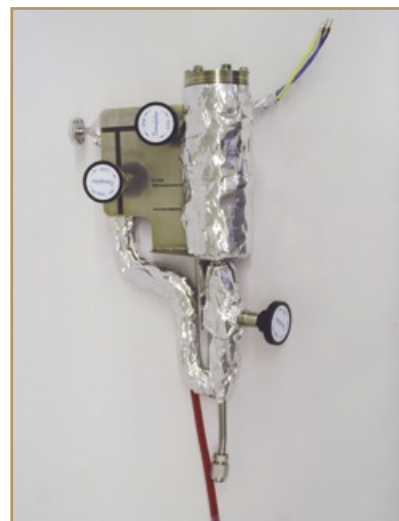
The injector tube is water cooled on its outside to reduce the thermal load on the UHV system and to minimize outgassing during operation.

An easy and safe refilling procedure is provided by the use of a removable additional reservoir. This heatable refilling unit can be filled with reactive alkali metal source material within an inert gas floated external glove box, closed tightly and be mounted to the source. Thus, "quasi in-situ refilling" of the evaporator reservoir is made possible.

- Compatible with all MBE systems
- 150 cm³ reservoir for large capacity
- Ideal source for Cs and Rb evaporation
- Precise and very fast flux control
- Easy and safe refilling procedure
- Integrated water-cooled injector



HPM power supply, controllers, cables and heating thermostat for the AKS system



Refilling unit for save and easy refurbishment of the AKS evaporator reservoir without removing the cell from the vacuum chamber

Applications

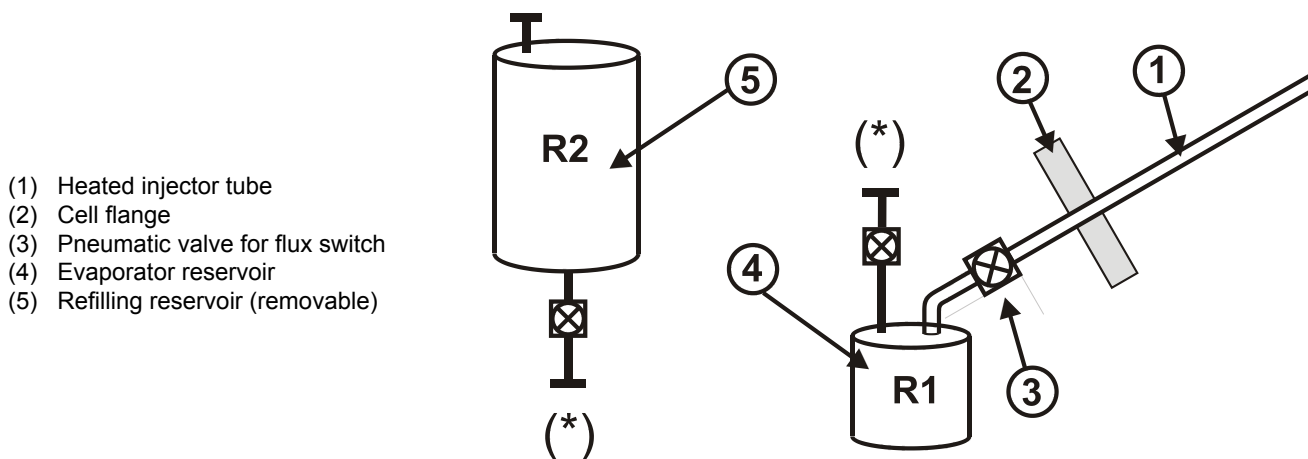
The main purpose of the Valved Alkali Metal Source AKS is the controlled evaporation of elemental alkali metals like Cs or Rb from the heated reservoir inside the cell into a vacuum chamber under high to ultra-high vacuum conditions (i.e. pressures below 1×10^{-6} mbar).

Typical applications for the AKS are:

- layer growth of Cs or Rb in MBE and surface science applications
- MBE fabrication of alkali metal based electronic devices, e.g. infrared-sensitive photocathodes

Technical Data

Mounting Flange	DN 63CF (O.D. 4.5"), others on request
Heating system	3 separate heater circuits (evaporator reservoir, valve & injector units)
Thermocouple	2x Type K Chromel/Alumel (injector/valve), 1x PT-100 (evaporator reservoir)
Outgassing temperature	valve 300°C, injector 300°C, evaporator reservoir 270°C
Operating temperature	valve 230°C, injector 230°C, evaporator reservoir 200°C
Bakeout temperature	200°C
Evaporator reservoir	150 cm ³
Flux control	integrated valve unit
Valve control	pneumatic operation, manual and remote control with TTL signal
Options	integrated rotary shutter (S)



Schematic of the main parts of the AKS source

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