

28 April 1982

FARADAY CUP Ø 90

Drawing PS 028-007LM3

The cup will be used on the RFQ lines at 50 keV and 520 keV both as a beam-stop and a beam current measuring device. It is bolted on the measuring box (MB) drawing PS 216-100LM2B.

The main parameters have been specified by J. Stovall from LANL.

Characteristics of the proton beam :

50 keV or 520 keV energy

150 mA proton-current

$2 \cdot 10^{-4}$ s pulse length

1 s⁻¹ repetition rate

1 kV voltage on the elect. trap ring.

The construction is based on the following principles :

- all metal parts are in aluminium (anticorodal) for smaller weight. The beam density being small (heat dissipation $\sim 0,5 \text{ W/cm}^2$) the beam-stop surface can also be in aluminium.
- The insulator is organic (delrin) with a small enough degassing rate for a vacuum of 10^{-7} microns. Same goes for rubber (perbunan) gaskets.
- The ceramic feed-through is of the same type as the ones on the electron trap in the CERN linac 2 LEBT. It can hold 2 kV.

The cup is cooled by natural air convection. Operating at 520 keV (15W heat dissipation) the beam-stop body would reach 22°C above ambient air temperature. At 50 keV (1,5W dissipation) the corresponding temperature rise would be 3°C.

The price of the Faraday cup is ~ 900 .- SFr.

The total production time is ~ 4 days.

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