

ENTRY NO: CU-8
Machine Name: CYCLONE 18/9
Date: 5/31/01 5:13:57 AM
Institution: Forschungszentrum Rossendorf
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HISTORY

Designed By: IBA s.a., Belgium

Construction Dates:

First Beam Date:

CHARACTERISTIC BEAMS

ions	/ energy(MeV/N)	/current(pps)	/power(w)
protons	18 MeV	30 A on target	540 W
deuterons	9 MeV	20 A on target	180 W

transmission efficiency(source to extract beam)

typical: % - **best:** %

transverse emittance

emittance definition:

vertical: π mm mrad

horizontal: π mm mrad

longitudinal: (Δ) E/E) %xdeg RF

USES

basic research: %

therapy: %

development: %

isotope production: 100%

other: %

maintenance: %

beam tuning: %

Total Time: 450h/year

TECHNICAL DATA

a)magnet: **type:** compact, deep valley design

Kb: MeV/A **Kf:** MeV/A

average field (min/max): 1.3 T

number of magnet sectors: 4

hill angular width: rad. varying: 54-48hill angular width

spiral (max): deg

pole parameters

diameter: 1.08 m

injection radius: m

extraction radius: 0.45-0.47 m

hill gap: 0.031m **valley gap:** 0.67m

trim coils

-number: x2

-current(max): A-turns

harmonic coils

-number: xNsectorsx2

-current(max): A-turns

main coils

number: 1x2

total ampere-turns: 112000 A-turns

current: 200 A

stored energy: MJ

weight - iron: 20t coils: 2t

power

main coils (total): 24 kW

trim coils (total max): kW

refrigerator (cryogenic): kW

b)RF

acceleration

frequency range: 41.8MHz

harmonic modes: 2 and 4

number of dees: 2

number of cavities: 2

dee angular width: effective 30degrees

voltage

at injection: kV(peak to ground, max)

at extraction: kV(peak to ground, max)

peak: 32kV(peak to ground, max)

line power(max): 10kW

stability

phase: deg

voltage: %

injection

c)ion source: 2 x cold cathode PIG

external injection:

components:

source bias voltage: kV

injection energy: MeV/N

buncher:

injection efficiency: %

d)injector:

e)extraction

stripper foils, 370 g/cm²; pure carbon on Al forks

efficiency

typical: 45-60%

best: 70%

f)vacuum

pumps: 4 x Edwards diffstack 160/700

achieved vacuum: 6.5E-5Pa

REFERNCES

1. St. Preusche et al., The new cyclotron of the Rossendorf PET Center, in: Cyclotrons and Their applications, pp 575-578, World Scientific Publishing Co. Pte. Ltd., 1996

2. St. Preusche et al., Long-distance transport of radionuclides between PET cyclotron and PET radiochemistry, Appl. Rad. Isot., 1999, 51, 625-630

EXPERIMENTAL FACILITIES

2 m long beam transport line at one of the 8 exits

COMMENTS