

ENTRY NO: CU-28
Machine Name: UW Medical Physics CTI RDS Cyclotron
Date: 5/22/01 1:20:57 PM
Institution: University of Wisconsin
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HISTORY

Designed By: CTI Inc, Knoxville TN (George Hendry)
Construction Dates: 1983-4
First Beam Date: 1984

CHARACTERISTIC BEAMS

ions	/ energy(MeV/N)	/current(pps)	/power(w)
p	11.4 MeV	50-100 A	1 kW

transmission efficiency(source to extract beam)

typical: 90% - best: 95%

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: 95%

other: %

maintenance: 5%

beam tuning: %

Total Time: 300h/year

TECHNICAL DATA

a)magnet: type: compact

Kb: MeV/A Kf: MeV/A

average field (min/max): 1.5 T T

number of magnet sectors: 3

hill angular width: 60hill angular width

spiral (max): deg

pole parameters

diameter: m

injection radius: m

extraction radius: m

hill gap: m valley gap: m

trim coils

-number: x2

-current(max): A-turns

harmonic coils

-number: 1x3x2xNsectorsx2

-current(max): A-turns

main coils

number: x2

total ampere-turns: A-turns

current: 300 A

stored energy: MJ

weight - iron: 30t coils: t

power

main coils (total): 30 kW

trim coils (total max): kW

refrigerator (cryogenic): kW

b)RF

acceleration

frequency range: 27MHz

harmonic modes: 1

number of dees: 2

number of cavities: 2

dee angular width: 90degrees

voltage

at injection: 2kV(peak to ground, max)

at extraction: kV(peak to ground, max)

peak: kV(peak to ground, max)

line power(max): 100kW

stability

phase: deg

voltage: %

injection

c)ion source: PIG

external injection:

components:

source bias voltage: kV

injection energy: MeV/N

buncher:

injection efficiency: %

d)injector:

e)extraction

4 carrousels with 3 stripper foils each serving 4 target positions.

Carousel #4 has radial motion to permit irradiation of two targets simultaneously.

efficiency

typical: 95%

best: 95%

f)vacuum

pumps: 2 - 10" Diffusion pumps

achieved vacuum: 2x10(-7) mPa

REFERENCES

Nickles R.J. Production of a Broad Range of Radionuclides with an 11 MeV Proton Cyclotron. J Label Comp Radiopharm 30, 120 (1991). Votaw Jr, Nickles R.J. Radionuclide Production for Positron Emission Tomography: Choosing an Appropriate Cyclotron. Nucl Instr Meth B40,1093 (1989).

EXPERIMENTAL FACILITIES

Vertical switching magnet for irradiating molten targets. Several dozen specialty targets for isotope production. Facilities for irradiating rotating "stents" for cardiac research. Complete PET chemistry labs for tracer synthesis. Adjacent CTI 933/04 PET scanner for research studies on animals

COMMENTS