

ENTRY NO: CU-22
Machine Name: Scanditronix MC-60 PF
Date: 6/6/01 8:55:36 AM
Institution: Douglas Cyclotron Unit, Clatterbridge Centre for Oncology
Address: Bebington, Wirral UK
In Charge of Cyclotron: A Kacperek
Telephone: ++44 (0)151 334 6366
Fax: ++44 (0)151 334 2845
Person Reporting: A Kacperek
Web:
E-mail: andrzejkc@ccotrust.co.uk

HISTORY

Designed By: Scanditronix SA
Construction Dates: 1983-84
First Beam Date: 1985

CHARACTERISTIC BEAMS

ions	/ energy(MeV/N)	/current(pps)	/power(w)
p	62	50 uamps	

transmission efficiency(source to extract beam)

typical: 70% - best: 85%

transverse emittance

emittance definition: not known

vertical: $<15\pi$ mm mrad

horizontal: $<15\pi$ mm mrad

longitudinal: <0.1 % energy(Δ) E/E)%xdeg RF

USES

basic research: %	therapy: 80%
development: 5%	isotope production: 10%
other: 5%	maintenance: %
beam tuning: %	Total Time: 700h/year

TECHNICAL DATA

a)magnet: type: simple yoke
Kb: MeV/A Kf: MeV/A
average field (min/max): 1.77 ave. T
number of magnet sectors: 3
hill angular width: hill angular width
spiral (max): deg
pole parameters
diameter: 1.6 m
injection radius: 0 m
extraction radius: m
hill gap: m valley gap: m
trim coils
-number: 6x2
-current(max): 260 amp total A-turns
harmonic coils
-number: 4 sets x 3xNsectorsx2
-current(max): A-turns
main coils
number: 1x2
total ampere-turns: A-turns
current: 900 A
stored energy: MJ
weight - iron: 120t coils: t
power
main coils (total): 110 kW
trim coils (total max): 5 kW
refrigerator (cryogenic): 565 kW

b)RF

acceleration

frequency range: 25.7MHz
harmonic modes: 2
number of dees: 2
number of cavities: 2
dee angular width: 80degrees
voltage
at injection: nakV(peak to ground, max)
at extraction: nakV(peak to ground, max)
peak: 40kV(peak to ground, max)

line power(max): 120kW

stability

phase: deg
voltage: $<0.1\%$

injection

c)ion source: PIG 300 mA

external injection:

components:
source bias voltage: 2kV
injection energy: MeV/N
buncher:

injection efficiency: %

d)injector: NA

e)extraction

electromagnetic (EMC) electrostatic deflector (55 Kv)

efficiency

typical: %
best: %

f)vacuum

pumps: 2 x 4000 l/sec oil diff pumps with baffles
achieved vacuum: $<10^{-5}$ Pa

REFERENCES

BONNETT DE, KACPEREK A, SHEEN MA, GOODALL R and SAXTON TE 1993 The 62 MeV proton beam for the treatment of ocular melanoma at Clatterbridge. British Journal of Radiology 66, 907-914.

EXPERIMENTAL FACILITIES

I treatment room; 4 available beam lines for irradiation;

COMMENTS