ENTRY NO: CU29
Date: 28 Feb 2005 14:10:40
Machine Name: UW Medical Physics CTI RDS Cyclotron
Institution: University of Wisconsin
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Person in Charge of Cyclotron: RJ Nickles
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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 extracted beam)
Typical (%): 90
Best (%): 95
Emittance
Emittance Definition:
Vertical (pi mm mrad):
Horizontal (pi mm mrad):
Longitudinal (dE/E[%] x RF[deg.]):
USES
Basic Research (%):
Development (%):
Therapy (%):
Isotope Production (%): 95
Other Application (%):
Maintenance (%): 5
Beam Tuning (%):
Total Time (h/year): 300

TECHNICAL DATA
(a)Magnet
Type: compact
Kb (MeV):
Kf (MeV):
Average Field (min./max. T): 1.5 T
Number of Sectors: 3
Hill Angular Width (deg.): 60
Spiral (deg.):
Pole Diameter (m):
Injection Radius (m):
Extraction Radius (m):
Hill Gap (m):
Valley Gap (m):
Trim Coils
Number: x2
Maximum Current (A-turns):
Harmonic Coils
Number: 1x3x2xNsectorsx2
Maximum Current (A-turns):
Main Coils
Number: x2
Total Ampere Turns:
Maximum Current (A): 300
Stored Energy (MJ):
Total Iron Weight (tons): 30
Total Coil Weight (tons):
Power
Main Coils (total KW): 30
Trim Coils (total, maximum, KW):
Refrigerator (cryogenic, KW):

(b)RF
Acceleration
Frequency Range (MHz): 27
Harmonic Modes: 1
Number of Dees: 2
Number of Cavities: 2
Dee Angular Width (deg.):90
Voltage
At Injection (peak to ground, KV): 2
At Extraction (peak to ground, KV):
Peak (peak to ground, KV):
Line Power (max, KW): 100
Phase Stability (deg.):
Voltage Stability (%):

(c)Injection
Ion Source: PIG
Source Bias Voltage (kV):
External Injection:
Buncher Type:
Injection Energy (MeV/n):
Component:
Injection Efficiency (%):
Injector:

(d)Extraction
Elements, Characteristic: 4 carrousels with 3 stripper foils each serving 4 target positions. Carrousel #4 has radial motion to permit irradiation of two targets simultaneously. efficiency
Typical Efficiency (%): 95
Best Efficiency (%): 95

(e)Vacuum
Pumps: 2 – 10” Diffusion pumps
Achieved Vacuum (Pa): 2x10(-7) m

REFERENCES Nickles RJ. Production of a Broad Range of Radionuclides with an 11 MeV Proton Cyclotron. J Label Comp Radiopharm 30, 120 (1991). Votaw Jr, Nickles RJ. 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