ENTRY NO: CM09
Date: 14 Feb 2005 22:11:16
Machine Name: HM12
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Web Address: www.shi.co.jp/quantum/index.htm1
Person in Charge of Cyclotron:
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History
Designed by:
Construction Dates: 1993
First Beam Date: 1996, modified in 2003
Characteristic Beams

ions /	energy(MeV/N)	current(pps)/power(w)
H-	12	90 micro-ampere
D-	6	40 micro-ampere

Transmission Efficiency (source to extracted beam)
Typical (%):
Best (%):
Emittance
Emittance Definition:
Vertical (pi mm mrad):
Horizontal (pi mm mrad):
Longitudinal (dE/E[%] x RF[deg.]):
USES
Basic Research (%):
Development (%):
Therapy (%):
Isotope Production (%):
Other Application (%):
Maintenance (%):
Beam Tuning (%):
Total Time (h/year):

TECHNICAL DATA
(a)Magnet
Type: compact
Kb (MeV):
Kf (MeV):
Average Field (min./max. T): 1.5
Number of Sectors: 4
Hill Angular Width (deg.): 54
Spiral (deg.): 0
Pole Diameter (m): 0.8
Injection Radius (m):
Extraction Radius (m): 0.34
Hill Gap (m): 0.036
Valley Gap (m): 0.095
Trim Coils
Number: 2x2
Maximum Current (A-turns):
Harmonic Coils
Number: 0xNsectorsx2
Maximum Current (A-turns):
Main Coils
Number: 1x2
Total Ampere Turns: 72000
Maximum Current (A): 180
Stored Energy (MJ):
Total Iron Weight (tons): 14
Total Coil Weight (tons): 0.6
Power
Main Coils (total KW):
Trim Coils (total, maximum, KW):
Refrigerator (cryogenic, KW):

(b)RF
Acceleration
Frequency Range (MHz): 45
Harmonic Modes: 2(H-)/4(D-)
Number of Dees: 2
Number of Cavities: 2
Dee Angular Width (deg.):45
Voltage
At Injection (peak to ground, KV): 34
At Extraction (peak to ground, KV): 34
Peak (peak to ground, KV): 34
Line Power (max, KW):
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: Stripping (carbon foil)
Typical Efficiency (%): 100
Best Efficiency (%):

(e)Vacuum
Pumps: 2 sets of diffusion pumps
Achieved Vacuum (Pa): 2*10-5

REFERENCES

EXPERIMENTAL FACILITIES

COMMENTS