

ENTRY NO: CM02

Date: 3 Feb 2005 10:26:15

Machine Name: C14 Self-Extraction

Institution: Ion Beam Applications (IBA)

Address:

Chemin du Cyclotron 3 - 1348 Louvain-La-Neuve Belg

Telephone: 32-10-475811

Fax: 32-10-475.810

Web Address: www.iba-worldwide.com

Person in Charge of Cyclotron: S. Lucas

Person Reporting Information: W. Kleeven

E-mail Address: INFO-TG@IBA.BE

History

Designed by: Ion Beam Applications (IBA)

Construction Dates: Jan 1998 - Dec 2000

First Beam Date: December 2000

Characteristic Beams

proton 14 (MeV) 5 (mA) 70 (kW)

Transmission Efficiency (source to extracted beam)

Typical (%) : 75

Best (%) : 80

Emittance

Emittance Definition:

Vertical (pi mm mrad): unknown

Horizontal (pi mm mrad): unknown

Longitudinal (dE/E[%] x RF[deg.]): unknown

USES

Basic Research (%) :

Development (%) :

Therapy (%) :

Isotope Production (%) : 100

Other Application (%) :

Maintenance (%) :

Beam Tuning (%) :

Total Time (h/year):

TECHNICAL DATA

(a)Magnet

Type: compact

Kb (MeV): 14

Kf (MeV): 14

Average Field (min./max. T): 1.1 (1.8/0.3)

Number of Sectors: 4

Hill Angular Width (deg.): 45

Spiral (deg.): 0

Pole Diameter (m): 0.52 - 0.56

Injection Radius (m): 0.02

Extraction Radius (m): 0.48

Hill Gap (m): 0.04 - 0.015

Valley Gap (m): 0.67

Trim Coils

Number: 0x2

Maximum Current (A-turns): N/A

Harmonic Coils

Number: 2xNsectorsx2

Maximum Current (A-turns): 300

Main Coils

Number: 2x2

Total Ampere Turns: 126000

Maximum Current (A): 175

Stored Energy (MJ): 0.03

Total Iron Weight (tons): 20

Total Coil Weight (tons): 2

Power

Main Coils (total KW): 22

Trim Coils (total, maximum, KW): N/A

Refrigerator (cryogenic, KW): N/A

(b)RF

Acceleration

Frequency Range (MHz): 67

Harmonic Modes: 4

Number of Dees: 2

Number of Cavities: 4

Dee Angular Width (deg.):40

Voltage

At Injection (peak to ground, KV): 45

At Extraction (peak to ground, KV): 55

Peak (peak to ground, KV): 55

Line Power (max, KW): 200

Phase Stability (deg.): 0.1

Voltage Stability (%) : 0.1

(c)Injection

Ion Source: PIG

Source Bias Voltage (kV):

External Injection:

Buncher Type:

Injection Energy (MeV/n):

Component:

Injection Efficiency (%) : N/A

Injector:

(d)Extraction

Elements, Characteristic: Self-Extraction Principle

Typical Efficiency (%) : 75

Best Efficiency (%) : 80

(e)Vacuum

Pumps: 2 ODPs

Achieved Vacuum (Pa): 5*10-6

REFERENCES 1) W. Kleeven, M. Abs, J.C. Amelia, W. Beeckman, J.L. Bol, V. Danloy, Y. Jongen, G. Lannoye, S. Lucas, J. Ryckewaert, D. Vandeplassche, S. Zarembo, † Self-Extraction in a Compact High-Intensity H+ Cyclotron ‡ EPAC2000, 2) W. Kleeven, S. Lucas, S. Zarembo, W. Beeckman, D. Vandeplassche, M. Abs, P. Verbruggen, Y. Jongen ‡ The Self-Extracting Cyclotron ‡ CYCLOTRONS 2001 3) W. Kleeven, W. Beeckman, S. Lucas, S. Zarembo, D. Vandeplassche, Y. Jongen ‡ Magnetic Field Calculations and Shimming of the Self-Extracting Cyclotron ‡ CYCLOTRONS 2001

EXPERIMENTAL FACILITIES

IBA Isotope Productions Facility Fleurus, Belgium

COMMENTS