

Entry: **C37**
 Machine Name:RIKEN..Ring..Cyclotron.....
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HISTORY

Design by:RIKEN.....
 Construction time:.....1980-1986.....
 First beam:Dec.16.1986.....

CHARACTERISTIC BEAMS

ions / energy (MeV/n) / current (pps) / power (W) :

- P./..210./..2×10¹¹./..60.....
- d,¹²C,²⁰Ne./..135./..1-3×10¹²./..-.....
- ⁴⁰Ar./..24./..1.3×10¹³./..2000.....
- ¹³⁶Xe./..26./..6×10¹¹./..350.....

transmission efficiency (total)
 - typical:70....% - best:91....%
 transverse emittance (rms)
 - vertical:.....0.7.....π mmmrad
 - horizontal:.....0.7.....π mmmrad
 longitudinal emittance (rms)ΔE/E.deg RF

USES

basic research:70. % therapy: %
 development: % isotope production: %
 other applications: % maintenance:15.... %
 beam tuning:.....15.... %
 total time:6500.... h/year

TECHNICAL DATA

a) magnet
 type:Straight..Sector.....
 Kb:540..q²/A²..... MeV/A Kf: MeV/A
 average field (min-max):-0.97..... T
 number of magnet sectors:4.....
 - angle:50..... deg
 - spiral (max):.....0..... deg
 pole parameters
 - diameter: m
 - injection radius:0.89..... m
 - extraction radius:3.56..... m
 hill gap:0.08..... m valley gap: m
 field trimming
 - trim coils
 - number:26×4..pairs.....
 - current (max):230-600..... A
 - harmonic coils
 - number: A
 - current (max): A
 - others
 - number: A
 - current (max): A
 main coils:
 - number:2.pairs×4.....
 - Ampere-turns:128000..... A.T.
 - current:1072..... A
 stored energy: MJ
 weight : - iron:2100.... t - coils:16.....t
 power
 - main coils (total): kW
 - trim coils (total max): kW
 - refrigerator (cryogenic): kW

b) RF

- acceleration
 - frequency range:18.-.45..... MHz
 - harmonic modes:5,9,10,11.....
 - number of dees:2.....
 - angular aperture:23.5..... deg
 - voltage:- average (min-max):-300.... kV
 - variation with radius:
 - power in (max):300×2..... kW
 - stability: - phase: ± 0.2deg - voltage: ±0.015. %

- other cavities
 - purpose:
 - frequency range: MHz
 - region of influence: m
 - voltage (max): kV
 - power in (max): kW
 - stability:- phase: deg - voltage: %

c) injection

- internal source:
 - external (radial/axial):
 - elements: ...Magnetic..channel.....
Electrostatic..channel.....
 - source voltage:.....—..... kV
 - injection energy:.....0.5-7..... MeV/n
 - buncher:
 - injection efficiency:70..... %

d) ion sources/injector

.....715..Cyclotron.....Heavy..ion..linac.....

e) extraction

- elements, characteristics:
 - ...Electrostatic..channel.....
 - ...Magnetic..channel.....
 -

- efficiency

- typical:80....% - best:100..... %

f) vacuum

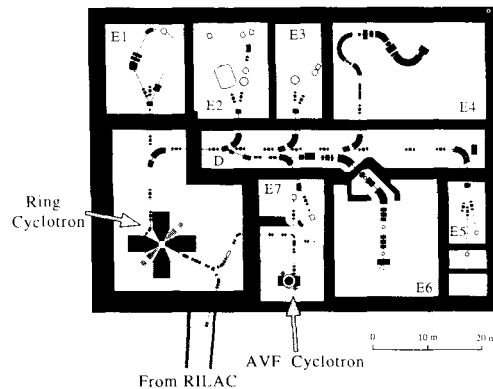
- pumps: ...5000.l/s...cryopanel×.4.....
10000.l/s...cryopump×.10.....
 - achieved vacuum:8×10⁻¹¹..... Pa

REFERENCES

...Y.Yano...Proc..13th..Int.Cyclo...Conf...102(1992).....

EXPERIMENTAL FACILITIES

..14..Target..stations..Projectile..Fragment.....
 ..Separator..(RIPS)..QQD-QD..spectrometer(SMART),.....
 ..GARIS./..IGISOL...Large..Scattering.chamber(ASCHRA) ...
PLAN VIEW OF FACILITY



COMMENTS

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