

ENTRY NO. C36 Date June 1992
 Name of Machine V.U. AVF. Cyclotron
 Institution Vrije Universiteit
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 In Charge: P.J. van der Jagt Reported by: C. Hoekstra

HISTORY

MILESTONE DATES:

Design Model Tests
 Construction First Beam April 1965
 DESIGN/CONSTRUCTION BY:
 in house other Philips
 COST: Accelerator Facility
 FUNDED BY: Vrije Universiteit

STATUS

STAFF: Machine
 Scientists 1 Engineers 1
 Technicians 11 Students 0
 Research (in house/external)
 Scientists / Engineers /
 Technicians / Students /
 BUDGET: Machine Funded by
 Research Funded by
 TIME DISTRIBUTION:
 Basic Research (in house/external) % / 2 %
 Applied Program (in house/external) 2 % / 80 %
 Development 1 % Maintenance 15 %

MAGNET

POLE PARAMETERS:
 Diameter 70 cm R_{extract} 59 cm R_{inject} 2 cm
 HILL PARAMETERS: Gap (min) 15 cm B_{max} 2 T
 (@ 0.4e6 AT) Gap (max) 27 cm B_{min} 1 T
 VALLEY PARAMETERS: Gap (min) cm B_{max} T
 (@ AT) Gap (max) cm B_{min} T
 AVERAGE FIELD: < B >_{min} 0.3 T < B >_{max} 1.5 T
 NUMBER OF SECTORS: compact/separated 3 /
 sector angle 65 deg. spiral (max) 37 deg.
 FIELD TRIMMING: Trim Coils 10
 Harmonic Coils 3
 Other
 CURRENT: Main Coils 450 Amps Stability
 Trim Coils 150 Amps Stability
 Stored Energy (cryogenic) MJ
 WEIGHT: Iron 100 Conductor 20 tons
 ION ENERGY: Bending Limit E/A = 30 q²/A² MeV/u
 Focussing Limit E/A = q/A MeV/u

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:
 Description: Single DEE-system
 No. of Gaps/turn 2 dE/dn(max) 0.05 MeV/q
 Voltage(max) 0.050 MV Harmonic f_{rf}/f_{ion} 1.3
 Freq 6.22 MHz Power in(max) 0.085 MW
 Stability: Phase Voltage
 OTHER CAVITIES (Flattopping or otherwise):
 Description:
 Region of Influence: R_{min} cm R_{max} cm
 No. of Gaps/turn dE/dn(max) MeV/q
 Voltage(max) MV Harmonic f_{rf}/f_{ion}
 Freq MHz Power in(max) MW
 Stability: Phase Voltage

VACUUM SYSTEM

OPERATING PRESSURE: 2.e-6
 PUMPS: No. and type 1 oil.diff 6000 l/sec

ION SOURCE(S)

Type	Intensity (mA)	Q	ε _n = βγϵ (πmm mrad)	Ion Species
(a) Livingston	0.3			p, d, He3, α
(b)				
(c)				
(d)				

INJECTION SYSTEM

Efficiency %

EXTRACTION SYSTEM

Electrostatic + Magnetic Channel Efficiency 70 %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current(part μA)	
		Internal	External
(a) p	2 - 28	200	35
(b) d	1 - 16		15
(c) He3	6 - 45		10
(d) α	5 - 32		10

Secondary Particles	E (MeV)	part/sec
(a)		
(b)		
(c)		

EXTRACTED BEAM PROPERTIES:

For 30 μA of 24 MeV/u p ions
 ΔE/E 0.3 % Δφ 40 °rf
 ε_n = βγϵ x 5 πmm mrad z 5 πmm mrad

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed m² Moveable m²

Target Stations: No. Served At Same Time:

MAGNETIC SPECTROMETERS:

OTHER FACILITIES:

Internal Isotope Production

External Isotope Production

REFERENCES/NOTES

(a)
 (b)

PLAN VIEW OF FACILITY, COMMENTS

