ENTRY NO. C23 **Date** August 95

Name of Machine Karlsruher Isochronous Cyclotron (KIZ)

Institution Forschungszentrum Karlsruhe Technik und Umwelt, Cyclotron-Laboratory

Address D-76021 Karlsruhe, Postfach 3640, Germany

Tel 07247-82-2433 **Telex** 17724716 **Fax** 07247-82-3156 **E-MAIL**

In Charge: H. Schweickert **Reported by:** J. Möllenbeck

HISTORY

MILESTONE DATES:
Design 1958 Model Tests 1958-60
Construction 1960-62 First Beam

DESIGN/CONSTRUCTION BY:
in house other AEG

COST: Accelerator $4.6 \cdot 10^6$ DM Facility $20 \cdot 10^6$ DM

FUNDED BY: Federal Government, State of Baden-Württemberg

STATUS

STAFF: Machine
Scientists - Engineers 1
Technicians 3 Students
Research (in house/external)
Scientists 5 / 10 Engineers 2 / 4
Technicians 4 / 10 Students 2 / 10

BUDGET: Machine ~ 6 Funded by Project
Research $1.5 \cdot 10^6$ DM Funded by Fusion research

TIME DISTRIBUTION:
Basic Research (in house/external) 80 % / 20 %
Applied Program (in house/external) 90 % / 10 %
Maintenance 3 % Development 4 %

MAGNET

POLE PARAMETERS:
Diameter 225 cm $R_{extract}$ 105 cm R_{inject} cm

HILL PARAMETERS: Gap (min) 8 cm B_{max} 1.95 T
(@ 0.16×10^6 AT) Gap (max) cm B_{min} T

VALLEY PARAMETERS: Gap (min) 16 cm B_{max} 0.95 T
(@ 0.16×10^6 AT) Gap (max) cm B_{min} T

AVERAGE FIELD: $<B>_{min}$ 1.43 T $<B>_{max}$ T

NUMBER OF SECTORS: compact/separated 3 /
sector angle deg. spiral (max) deg.

FIELD TRIMMING: Trim Coils 6 on hill sectors
Harmonic Coils 6 on hill sectors
Other

CURRENT: Main Coils 360 Amps Stability 10^{-6}
Trim Coils 10 Amps Stability 10^{-3}
Stored Energy (cryogenic) MJ

WEIGHT: Iron 280 tons Conductor

ION ENERGY: Bending Limit E/A = 104 q^2/A^2 MeV/u
Focusing Limit E/A = 26 q/A MeV/u

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:
Description: self existed system, 3 Dees
No. of Gaps/turn 6 dE/dn(max) 0.24 MeV/q
Voltage (max) 0.05 MV Harmonic f_{rf}/f_{ion} 3
Freq 33 MHz Power in(max) 0.05 MW
Stability: Phase ± 1 deg Voltage 10^{-3}

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: 2×10^{-6} torr
PUMPS: (No. and type) 2 diffusion pumps
2×12.000 l/sec

ION SOURCE(S)

	Type	Intensity (mA)	@ $\varepsilon_n = \beta\gamma\varepsilon$ (π mm mrad)	Ion Species
(a)	Hot cathode penning			H_2^+, d, $^4He^{2+}$
(b)				
(c)				
(d)				

INJECTION SYSTEM

Efficiency %

EXTRACTION SYSTEM

Efficiency %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (part μA) Internal	External
(a) H_2^+, d	26	300	30
(b) He	26	100	15
(c)			
(d)			

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

EXTRACTED BEAM PROPERTIES:
For 1 μA of MeV/u d ions
$\Delta E/E$ 0.1 % $\Delta\phi$ 5 - 10 °rf
$\varepsilon_n = \beta\gamma\varepsilon$ x 8 π mm mrad z 4 π mm mrad

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed: 350 m^2 Moveable m^2
Target Stations: 3 No. Served At Same Time: 1
MAGNETIC SPECTROMETERS:
OTHER FACILITIES: Dual Beam Facility

REFERENCES/NOTES

(a) Proc. 7th Int. Conf. on cyclotrons, p. 496
(b) Proc. 12th Int. Conf. on cyclotrons, p. 194

PLAN VIEW OF FACILITY, COMMENTS