

ENTRY NO. C22 Date October 1995
 Name of Machine JULIC
 Institution Institut für Kernphysik des Forschungszentrums Jülich GmbH (KFA)
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HISTORY

MILESTONE DATES:
 Design 1963 Model Tests 1963-1965
 Construction 1966-1969 First Beam int. 1968
 DESIGN/CONSTRUCTION BY:
 in house other AEG-Frankfurt
 COST: Accelerator 19 · 10⁶ DM Facility 29 · 10⁶ DM
 FUNDED BY: Kernforschungsanlage Jülich

STATUS

STAFF: Machine
 Scientists (a) Engineers (a)
 Technicians (a) Students (a)
 Research (in house/external)
 Scientists / Engineers /
 Technicians / Students /
 BUDGET: Machine (b) Funded by
 Research (b) Funded by
 TIME DISTRIBUTION:
 Basic Research (in house/external) (c) % / %
 Applied Program (in house/external) (c) % / %
 Maintenance % Development %

MAGNET

POLE PARAMETERS:
 Diameter 330 cm R_{extract} 154 cm R_{inject} cm
 HILL PARAMETERS: Gap (min) 8.4 cm B_{max} 1.92 T
 (@ AT) Gap (max) cm B_{min} T
 VALLEY PARAMETERS: Gap (min) 24 cm B_{max} 0.7 T
 (@ AT) Gap (max) cm B_{min} T
 AVERAGE FIELD: _{min} 0.95 T _{max} 1.35 T
 NUMBER OF SECTORS: compact/separated 3 /
 sector angle deg. spiral (max) 20 deg.
 FIELD TRIMMING: Trim Coils 9
 Harmonic Coils -
 Other -
 CURRENT: Main Coils 400 Amps Stability 2 · 10⁻⁶
 Trim Coils 9 Amps Stability 1 · 10⁻⁴
 Stored Energy (cryogenic) MJ
 WEIGHT: Iron 700 tons Conductor 12 tons
 ION ENERGY: Bending Limit E/A = 180 q²/A² MeV/u
 Focusing Limit E/A = q/A MeV/u

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:
 Description: 3 dees, angle 40 deg
 No. of Gaps/turn 6 dE/dn(max) 0.24 MeV/q
 Voltage (max) 0.045 MV Harmonic f_{rf}/f_{ion} 3
 Freq 20-30 MHz Power in(max) 0.1 MW
 Stability: Phase <± 0.5 deg Voltage <± 1 · 10⁻⁴
 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 · 10⁻⁷ mbar
 PUMPS: (No. and type) 3 cryo 10.000 l/s each
 2 turbo 2.200 l/s each

ION SOURCE(S)

Type	Intensity (mA)	@ ε _n = βγc (π mm mrad)	Ion Species
(a) ECR 2.45 GHz			H ₂ ⁺
(b) Neg. Ion. S.			H ⁻
(c) Pol. Neg. Ion. S.			pol. H ⁻
(d)			

INJECTION SYSTEM

axial, magn. comp. Efficiency %

EXTRACTION SYSTEM

el. static, defl. screen. + foc. chan. Efficiency ~ 60 %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (part μA)	Internal	External
(a) H ₂ ⁺	22.5 - 45			> 10
(b) H ⁻	22.5 - 45			> 10
(c) pol. H ⁻	22.5 - 45			
(d)				

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

EXTRACTED BEAM PROPERTIES:
 For 10 μA of 38 MeV/u H₂⁺ ions
 ΔE/E 0.3 % Δφ 14 °rf
 ε_n = βγc x 2.5 π mm mrad z 5 π mm mrad

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed: m² Moveable m²
 Target Stations: No. Served At Same Time:

MAGNETIC SPECTROMETERS:

OTHER FACILITIES:

The cyclotron JULIC serves as injector for the cooler synchrotron COSY Jülich

REFERENCES/NOTES

- operation by COSY operating group
- common budget with COSY
- COSY injector

PLAN VIEW OF FACILITY, COMMENTS

