

**ENTRY NO:** C-16  
**Machine Name:** Karlsruher Isochronous Zyklotron (KIZ)  
**Date:** 6/5/01 1:28:56 PM  
**Institution:** Forschungszentrum Karlsruhe, Cyclotron-Lab  
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#### HISTORY

**Designed By:** AEG in 1958  
**Construction Dates:** 1960-1962  
**First Beam Date:** 1963

#### CHARACTERISTIC BEAMS

| ions  | / energy(MeV/N) | /current(pps) | /power(w) |
|-------|-----------------|---------------|-----------|
| -H2+  | 26              | 15 micro amps | 780       |
| -d2   | 26              | 20            | 1040      |
| -He+2 | 26              | 10            | 1040      |

#### transmission efficiency(source to extract beam)

**typical:** 95% - **best:** 95-100%

#### transverse emittance

##### emittance definition:

**vertical:**  $8\pi$  mm mrad

**horizontal:**  $4\pi$  mm mrad

**longitudinal:**  $5-10(\Delta) E/E$ %xdeg RF

#### USES

**basic research:** 10%      **therapy:** %  
**development:** 5%      **isotope production:** 10%  
**other:** 70%      **maintenance:** 3%  
**beam tuning:** %      **Total Time:** 800h/year

#### TECHNICAL DATA

**a)magnet:**      **type:** normal conductor(copper)

**Kb:** MeV/A      **Kf:** MeV/A

**average field (min/max):** 1.43/0.95/1.95 T

**number of magnet sectors:** 3

**hill angular width:** hill angular width

**spiral (max):** deg

#### pole parameters

**diameter:** 2.25 m

**injection radius:** m

**extraction radius:** 1.05 m

**hill gap:** 0.08m      **valley gap:** 0.16m

#### trim coils

-number: 6x2

-current(max): 6 A-turns

#### harmonic coils

-number: 6xNsectorsx2

-current(max): 15 A-turns

#### main coils

**number:** x2

**total ampere-turns:** A-turns

**current:** A

**stored energy:** MJ

**weight - iron:** 280t      **coils:** 3t

#### power

**main coils (total):** 35 kW

**trim coils (total max):** 5 kW

**refrigerator (cryogenic):** kW

#### b)RF

##### acceleration

**frequency range:** 33MHz

**harmonic modes:** 3

**number of dees:** 3

**number of cavities:**

**dee angular width:** degrees

#### voltage

at injection: kV(peak to ground, max)

at extraction: kV(peak to ground, max)

peak: kV(peak to ground, max)

**line power(max):** kW

#### stability

**phase:** deg

**voltage:** %

#### injection

**c)ion source:** Hot cathode penning

#### external injection:

**components:**

**source bias voltage:** 0-0.3kV

**injection energy:** MeV/N

#### buncher:

**injection efficiency:** %

#### d)injector:

#### e)extraction

2 electrostatic deflector

#### efficiency

**typical:** 50%

**best:** 60%

#### f)vacuum

**pumps:** 2 oil diffusion pumps

**achieved vacuum:**  $2 \times 10^{-6}$ Pa

#### REFERENCES

Proc. 7th Int. Conf. on Cyclotrons, p. 496 Proc. 12th Int. Conf. on Cyclotron p. 194 Proc. 13th Int. Conf. on Cyclotrons p. 801

#### EXPERIMENTAL FACILITIES

Experimental Hall Dual Beam Facility

#### COMMENTS