

**ENTRY NO:** CU-12  
**Machine Name:** MGC-20  
**Date:** 5/25/01 4:22:48 AM  
**Institution:** Institute of Nuclear Research (ATOMKI)  
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### HISTORY

**Designed By:** NIEFA, St. Petersburg, Russia  
**Construction Dates:** 1984-85  
**First Beam Date:** Nov. 1985

### CHARACTERISTIC BEAMS

ions	/ energy(MeV/N)/current(pps)/power(w)
proton	18 3.1E14 900
deuteron	5 3.1E14 500
He3++	9 7.5E13 675
alpha	5 7.5E13 500

### transmission efficiency(source to extract beam)

typical: % - best: %

### transverse emittance

#### emittance definition:

vertical:  $15\pi$  mm mrad

horizontal:  $30\pi$  mm mrad

longitudinal:  $(\Delta) E/E) \% \times \text{deg RF}$

### USES

**basic research:** 28%      **therapy:** %  
**development:** %      **isotope production:** 44%  
**other:** 6%      **maintenance:** 16%  
**beam tuning:** 6%      **Total Time:** 2600h/year

### TECHNICAL DATA

**a)magnet:** type: compact  
**Kb:** 20MeV/A    **Kf:** MeV/A  
**average field (min/max):** 1.4/0.7 T  
**number of magnet sectors:** 3  
**hill angular width:** hill angular width  
**spiral (max):** deg  
**pole parameters**  
**diameter:** 1.03 m  
**injection radius:** m  
**extraction radius:** 0.45 m  
**hill gap:** 0.072m    **valley gap:** 0.120m  
**trim coils**  
 -number: 4x2  
 -current(max): 15 A A-turns  
**harmonic coils**  
 -number: 2xNsectorsx2  
 -current(max): 15 A A-turns  
**main coils**  
**number:** 1x2  
**total ampere-turns:** A-turns  
**current:** 400 A  
**stored energy:** MJ  
**weight - iron:** 25t    coils: t  
**power**  
**main coils (total):** 32 kW  
**trim coils (total max):** 1 kW  
**refrigerator (cryogenic):** kW  
**b)RF**  
**acceleration**  
**frequency range:** 8-24MHz

**harmonic modes:** 1, 3  
**number of dees:** 2  
**number of cavities:** 2  
**dee angular width:** 180degrees  
**voltage**  
 at injection: kV(peak to ground, max)  
 at extraction: kV(peak to ground, max)  
 peak: 30kV(peak to ground, max)  
**line power(max):** 80kW  
**stability**  
**phase:** deg  
**voltage:** 0.1%  
**injection**  
**c)ion source:** internal, Livingstone-Jones  
**external injection:**  
**components:**  
**source bias voltage:** kV  
**injection energy:** MeV/N  
**buncher:**  
**injection efficiency:** %  
**d)injector:**  
**e)extraction**  
 electrostatic deflector, passive magnetic channel  
**efficiency**  
**typical:** 40%  
**best:** 55%  
**f)vacuum**  
**pumps:** oil diffusion  
**achieved vacuum:** 2E-04Pa  
**REFERENCES**

### EXPERIMENTAL FACILITIES

### COMMENTS

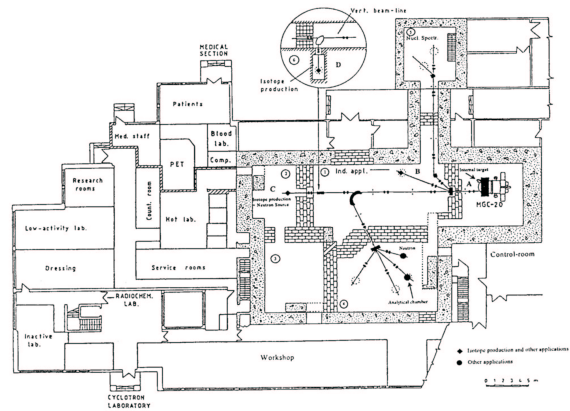


Figure 1 Layout of the cyclotron laboratory