ENTRY NO. 74

NAME OF MACHINE ..... MINICYCLOTRON MC40 ..... DATE ..... 1981-07-07 .....
INSTITUTION ..... INSTRUMENT AB SCANDITRONIX .....
ADDRESS ..... HUSBYBORG S-755 90 UPPSALA ... SWEDEN .....
TEL (0) 18-15 24 40 ... TELEX .. 76048 ... SCX S .....
IN CHARGE . STIG LINDBACK ..... REPORTED BY ... STIG LINDBACK .....

HISTORY AND STATUS

DESIGN, date ... 1974 ..... Model tests ... 1974 .....
ENG DESIGN, date ..... 1974-1975 .....
CONSTRUCTION, date ..... 1974-1976 .....
FIRST BEAM, date (or goal) .... 1976 .....
MAJOR ALTERATIONS .....
.....
COST, ACCELERATOR .....
COST, FACILITY, total .....
FUNDED BY .....

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS ..... ENGINEERS .....
TECHNICIANS ..... CRAFTS .....
GRAD STUDENTS involved during year .....
OPERATED BY ..... Research staff or ..... Operators
OPERATION ..... hr/wk. On target ..... hr/wk
TIME DISTR. in house ..... %, outside ..... %
BUDGET, op & dev .....
FUNDED BY .....

RESEARCH STAFF, not included above

USERS, in house ..... outside .....
GRAD STUDENTS involved during year .....
RESEARCH BUDGET, in house .....
FUNDED BY .....

MAGNET

POLE FACE, diameter (compact) . 130 .... cm, R-extraction . 50 ... cm
R injection .. -. . cm
GAP, min . 10. . cm, Field .. 21.3. kG
max . 18. . cm, Field .. 13.2. kG } at . 241,000 ..... Ampere turns
AVERAGE FIELD at R ext .... 17.9. kG
B max/ < B > ..... 1.19 .....
NUMBER OF SECTORS { compact ... 3 ... / separated ..... } Spiral, max . 45 deg
SECTOR ANGLE (SSC) ..... - ..... deg
TRIMMING COILS .. 8. concentric. gradient. coils .....
..... 4. sets. of. harmonic. coils .....
CONDUCTOR, material and type . Cu, . indirectly. cooled .....
STORED ENERGY (cryogenic) .. - ..... MJ
POWER: main coils . 130. max kW: current stability . 10^{-5} ..
trimming coils .. 10. max kW: current stability . 10^{-4} ..
WEIGHT: Fe .... 57 ..... tons: coils ..... 2,8 ..... tons
COOLING system .....
ION ENERGY (Bending limit) E/A = ... 40 .... q^2/A^2 MeV/amu
(Focusing limit) E/A = ... - ..... q/A MeV/amu

ACCELERATION SYSTEM

DEES, number ..... 2 ..... ; angle ..... 90 ..... deg
BEAM APERTURE .. 2 ..... cm; DC Bias .. 0 ..... kV
TUNED by, coarse .. mov. short .... fine ... variable. cond.
RF ..... 12 .... to .. 27 ..... MHz, stable ± ... 10^{-6} .....
Orb F .... 6 ..... to .... 26,8 ..... MHz
HARMONICS, RF/Orb F, used ..... 1,2 .....
DEE–Gnd, max .... 44 ..... kV, min gap ..... - ..... cm
STABILITY, (pk-pk noise)/(pk RF volt) ... $<10^{-3}$ .....
ENERGY GAIN, max ..... 176 ..... kV/turn
RF PHASE, stable to ± ..... 0,5 ..... deg
RF POWER input, max. .... 60 ..... kW
FREQUENCY MODULATION, rate ..... - ..... /s
modulator, type .....
beam pulse, width .... 15-20 deg, ...

VACUUM SYSTEM

OPERATING PRESSURE ..... $5,10^{-6}$ ..... Torr or mbar
PUMPS, No, Type, Size ..... 2. oil. diffusion. pumps, . Φ. 400 ea
..... 2. mechanical. fore pumps ....
.....

ION SOURCES

..... Internal. cold. cathode, . axially. mounted

INJECTION SYSTEM

.....

EXTRACTION SYSTEM

. Electrostatic. deflector, . magn, . focusing. channel ...

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed ..... m^2; movable ..... m^2
TARGET STATIONS ..... in ..... rooms
STATIONS served at same time, max .....
MAG SPECTROGRAPH, type .....
COMPUTER model .....
OTHER FACILITIES .....
.....
.....

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
p	9-40	9-40	>500	65
d	4.5-20	4.5-20	>500	65
He-3	9-40	9-40	>100	30
He-4	7-53	7-53	>100	30
SECONDARY				(part/s)

BEAM PROPERTIES

	MEASURED		CONDITIONS			
PULSE WIDTH	13. RF deg	.5.	pμA of	20.	MeV	p ions
PHASE EXC. max	RF deg	....	pμA of	.....	MeV	..... ions
EXTRACT eff	80. %	10.	pμA of	38.	MeV	p ions
RESOL ΔE/E	0,36. %	.1.	pμA of	30.	MeV	p ions
EMITTANCE						
(π mm-mrad)	16. axial / 10. rad	.5.	pμA of	30.	MeV	p

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS .... SOLID STATES PHYSICS .....
BIOMEDICAL APPLICAT..... ISOTOPE PRODUCTIONS .....
.....
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REFERENCES/NOTES

1)
2)

PLAN VIEW OF FACILITY, COMMENTS, ETC.

CONTROL: Conventional analog control or optionally computer control. Microprocessor based interlock system (including external interlocks)