ENTRY NO. CM17 **Date** October 5, 1995
Machine Name 930 AVF CYCLOTRON
Manufacturer Sumitomo Heavy Industries, Ltd.
Address 5-9-11, Kitashinagawa, Shinagawa-ku, Tokyo 141, Japan
Tel (03)5488-8322 **Telex**
Fax (03)5488-8321 **E-MAIL**
In Charge: **Reported by:** T.Tachikawa

HISTORY AND STATUS
DATES: Design **First Machine**
SALES: No. Sold/Operational 5 / 5 Currently Available Yes
COST: Accelerator **Facility**

MAGNET
POLE PARAMETERS:
Diameter 215.6 cm $R_{extract}$ 92.3 cm R_{inject} cm
HILL PARAMETERS: Gap (min) cm B_{max} 1.96 T
(@ 408.000 AT) Gap (max) 16.6 cm B_{min} 1.13 T
VALLEY PARAMETERS: Gap (min) cm B_{max} T
(@ 408.000 AT) Gap (max) 40.5 cm B_{min} T
AVERAGE FIELD: $<B>_{min}$ T $<B>_{max}$ 1.64 T
NUMBER OF SECTORS: compact/separated 4 /
sector angle deg. spiral (max) 53 deg.
FIELD TRIMMING: Trim Coils 12 pairs
Harmonic Coils 8 pairs
Other
CURRENT: Main Coils 900 Amps Stability $\pm 1\times10^{-5}$
Trim Coils 100-800 Amps Stability $\pm 2\times10^{-4}$
Stored Energy (cryogenic) MJ
WEIGHT: Iron 220 tons Conductor 9 tons
ION ENERGY: Bending Limit E/A = 110 q^2/A^2 MeV/u
Focusing Limit E/A = 95 q/A MeV/u

ACCELERATION SYSTEM
FUNDAMENTAL ACCELERATION:
Description: 90° 2 dees with λ/4 cavities
No. of Gaps/turn 4 dE/dn(max) 0.17 MeV/q
Voltage (max) 0.060 MV Harmonic f_{rf}/f_{ion} 1,2,3
Freq 10.6-22.0 MHz Power in(max) 2×0.07 MW
Stability: Phase ±0.5deg Voltage $\pm 1\times10^{-3}$

VACUUM SYSTEM
OPERATING PRESSURE: 5×10^{-7} Torr
PUMPS: (No. and type) 4 cryo. pumps + 1 turbo. pump

ION SOURCE(S)

	Type	Intensity (mA)	@ $\varepsilon_n = \beta\gamma\varepsilon$ (π mm mrad)	Ion Species
(a)	External (ECR or Multi-cusp)			
(b)				

INJECTION SYSTEM
Axial injection, Spiral inflector Efficiency 10-20 %

EXTRACTION SYSTEM
Electrostatic + Magnetic Efficiency 60-70 %

CHARACTERISTIC BEAMS

	Accelerated Ions	E/A (MeV/u)	Current (part. μA) Internal	External
(a)	H^+	90	25	10
(b)	D^+	35	68	41

EXTRACTED BEAM PROPERTIES:
For 3 μA of 4.4 MeV/u Ar^{8+} ions
ΔE/E 1.4 % Δφ 1.0 °rf
$\varepsilon_n = \beta\gamma\varepsilon$ x π mm mrad z π mm mrad

REFERENCES/NOTES
(a) Proc. of the Int. Conf. on Evolution in Beam Applications, Takasaki, Japan, 1991, p.270-274
(b)

ENTRY NO. CM18 **Date** February 09, 1996
Machine Name MGC-20
Manufacturer D.V. Efremov Institute
Address 189631 St. Petersburg, Russia
Tel (812)265-5682 **Telex**
Fax (812)265-7880 **E-MAIL**
In Charge: **Reported by:** Vorogushin

HISTORY AND STATUS
DATES: Design 1970 First Machine 1974
SALES: No. Sold/Operational / Currently Available
COST: Accelerator **Facility**

MAGNET
POLE PARAMETERS:
Diameter 103 cm $R_{extract}$ 45 cm R_{inject} cm
HILL PARAMETERS: Gap (min) 7.2 cm B_{max} 1.62 T
(@ $1,2\ 10^5$ AT) Gap (max) 7.2 cm B_{min} T
VALLEY PARAMETERS: Gap (min) 12.0 cm B_{max} 1.02 T
(@ $1,2\ 10^5$ AT) Gap (max) 12.0 cm B_{min} T
AVERAGE FIELD: $<B>_{min}$ 0.65 T $<B>_{max}$ 1.48 T
NUMBER OF SECTORS: compact/separated 3 /
sector angle deg. spiral (max) 35 deg.
FIELD TRIMMING: Trim Coils 4 pairs
Harmonic Coils 2 sets
Other
CURRENT: Main Coils 420 Amps Stability 0.01%
Trim Coils 15 Amps Stability 0.1%
Stored Energy (cryogenic) MJ
WEIGHT: Iron 24 t Conductor 1.2 t
ION ENERGY: Bending Limit E/A = q^2/A^2 MeV/u
Focusing Limit E/A = q/A MeV/u

ACCELERATION SYSTEM
FUNDAMENTAL ACCELERATION:
Description: 2 dees 180-140 deg
No. of Gaps/turn 2 dE/dn(max) 0.12 MeV/q
Voltage (max) 0.030 MV Harmonic f_{rf}/f_{ion} 1,3
Freq 8-24 MHz Power in(max) 0.05 MW
Stability: Phase ± 5 deg Voltage 0.1%

VACUUM SYSTEM
OPERATING PRESSURE: 10^{-5}
PUMPS: (No. and type) 3 diffusion pumps

ION SOURCE(S)

	Type	Intensity (mA)	@ $\varepsilon_n = \beta\gamma\varepsilon$ (π mm mrad)	Ion Species
(a)	hot filament Levingstone	p,d,		He -3(++)
(b)				

INJECTION SYSTEM
Efficiency %

EXTRACTION SYSTEM
electrostatic deflection Efficiency 50 %

CHARACTERISTIC BEAMS

	Accelerated Ions	E/A (MeV/u)	Current (part. μA) Internal	External
(a)	p,d	18 5	200	500
(b)	,He -3(++)	5, 8	50	25

EXTRACTED BEAM PROPERTIES:
For 50 μA of 18 MeV/u P ions
ΔE/E 0.3 % Δφ °rf
$\varepsilon_n = \beta\gamma\varepsilon$ x 50 π mm mrad z 15 π mm mrad

REFERENCES/NOTES
(a)
(b)