

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: $\langle B \rangle_{\text{min}}$ T $\langle B \rangle_{\text{max}}$ 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 $\pm 1 \times 10^{-5}$

Trim Coils 100-800 Amps Stability $\pm 2 \times 10^{-4}$

Stored Energy (cryogenic) MJ

WEIGHT: Iron 220 tons Conductor 9 tons

ION ENERGY: Bending Limit E/A = 110 $\text{q}^2/\text{A}^2 \text{ MeV/u}$

Focusing Limit E/A = 95 q/A MeV/u

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:

Description: 90° 2 dees with 2/4 cavities

No. of Gaps/turn 4 dE/dn(max) 0.17 MeV/q

Voltage (max) 0.060 MV Harmonic f_H/f_{ion} 1.2, 3

Freq 10.6-22.0 MHz Power in(max) 2×0.07 MW

Stability: Phase ± 0.5 deg Voltage $\pm 1 \times 10^{-4}$

VACUUM SYSTEM

OPERATING PRESSURE: 5×10^{-7} Torr

PUMPS: (No. and type) 4 cryo. pumps + 1 turbo. pump

ION SOURCE(S)

Type	Intensity (mA)	@ $\epsilon_n = \beta\gamma\epsilon$ (π mm mrad)	Ion Species
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(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

$\Delta E/E$ 0.3 % $\Delta\phi$ 1.0 °rf

$\epsilon_n = \beta\gamma\epsilon$ x 1.4 π mm mrad z 1.0 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

(@ $1.2 \cdot 10^5$ AT) Gap (max) 7.2 cm B_{min} T

VALLEY PARAMETERS: Gap (min) 12.0 cm B_{max} 1.02 T

(@ $1.2 \cdot 10^5$ AT) Gap (max) 12.0 cm B_{min} T

AVERAGE FIELD: $\langle B \rangle_{\text{min}}$ 0.65 T $\langle B \rangle_{\text{max}}$ 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 = $\text{q}^2/\text{A}^2 \text{ MeV/u}$

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_H/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)	@ $\epsilon_n = \beta\gamma\epsilon$ (π mm mrad)	Ion Species
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(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

$\Delta E/E$ 0.3 % $\Delta\phi$ 15 °rf

$\epsilon_n = \beta\gamma\epsilon$ x 50 π mm mrad z 15 π mm mrad

REFERENCES/NOTES

(a)
(b)