ENTRY NO. CM3 Date October 9, 1995
Machine Name CYCLONE 18/9
Manufacturer ION BEAM APPLICATIONS (IBA)
Address Rue J. Lenoir 6 - 1348 Louvain-la-Neuve, BELGIU
Tel 32-10-47.58.11 Telex
Fax 32-10-47.58.10 E-MAIL
In Charge: Yves JONGEN Reported by: Françoise VAMECQ

HISTORY AND STATUS

DATES: Design 01/04/90 First Machine 03/92
SALES: No. Sold/Operational 8 / 4 Currently Available Y
COST: Accelerator - Facility -

MAGNET

POLE PARAMETERS:
Diameter 108 cm $R_{extract}$ 48 cm R_{inject} 3 cm
HILL PARAMETERS: Gap (min) 3 cm B_{max} 2.1 T
(@ 112,000 AT) Gap (max) 3 cm B_{min} 2.1 T
VALLEY PARAMETERS: Gap (min) 67 cm B_{max} 0.6 T
(@ - AT) Gap (max) 67 cm B_{min} 0.6 T
AVERAGE FIELD: $<B>_{min}$ 1.35 T $<B>_{max}$ 1.35 T
NUMBER OF SECTORS: compact/separated 4 /
sector angle 57° deg. spiral (max) - deg.
FIELD TRIMMING: Trim Coils None
Harmonic Coils None
Other Iron edges (movable for deuterons)
CURRENT: Main Coils 200 Amps Stability 10^{-4}
Trim Coils N/A Amps Stability N/A
Stored Energy (cryogenic) N/A MJ
WEIGHT: Iron 20 Tons Conductor Copper 2 Tons
ION ENERGY: Bending Limit E/A = 20 q^2/A^2 MeV/u
Focusing Limit E/A = 20 q/A MeV/u

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:
Description: 2 x 30° Dees on lambda/4 straight stems
No. of Gaps/turn 4 dE/dn(max) 0.104 MeV/q
Voltage (max) 0.032 MV Harmonic f_{rf}/f_{ion} 2p/4d
Freq 42 MHz Power in(max) 0.010 MW
Stability: Phase Dees connected Voltage 8.10^{-3}

VACUUM SYSTEM

OPERATING PRESSURE: 0.10^{-6}
PUMPS: (No. and type) 4 x 700 l/sec ODP

ION SOURCE(S)

	Type	Intensity (mA)	@ $\varepsilon_n = \beta\gamma\varepsilon$ (π mm mrad)	Ion Species
(a)	PIG	1 DC		H^-
(b)	PIG	1 DC		d^-

INJECTION SYSTEM

2 internal sources Efficiency 10 %

EXTRACTION SYSTEM

Carbon Stripper Efficiency 100 %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (part. μA) Internal	External
(a) H^-	18	100	100
(b) d^-	4.5	> 35	> 35

EXTRACTED BEAM PROPERTIES:
For - μA of - MeV/u - ions
ΔE/E - % $\Delta\phi$ - °rf
$\varepsilon_n = \beta\gamma\varepsilon$ x - π mm mrad z - π mm mrad

REFERENCES/NOTES

(a) EPAC 1990, Y. Jongen Nice 1990
(b)

ENTRY NO. CM4 Date October 9, 1995
Machine Name CYCLONE 18+
Manufacturer ION BEAM APPLICATIONS (IBA)
Address Rue J. Lenoir 6 - 1348 Louvain-la-Neuve, BELGIU
Tel 32-10-47.58.11 Telex
Fax 32-10-47.58.10 E-MAIL
In Charge: Yves JONGEN Reported by: Pascal COHILIS

HISTORY AND STATUS

DATES: Design 1991 First Machine 1992
SALES: No. Sold/Operational 4 / 2 Currently Available Y
COST: Accelerator - Facility -

MAGNET

POLE PARAMETERS:
Diameter 108 cm $R_{extract}$ 48 cm R_{inject} 1 cm
HILL PARAMETERS: Gap (min) 3 cm B_{max} 2.0 T
(@ - AT) Gap (max) 3 cm B_{min} 1.4 T
VALLEY PARAMETERS: Gap (min) 60 cm B_{max} 0.9 T
(@ - AT) Gap (max) 60 cm B_{min} 0.3 T
AVERAGE FIELD: $<B>_{min}$ 1.3 T $<B>_{max}$ 1.37 T
NUMBER OF SECTORS: compact/separated 4 / -
sector angle 58 deg. spiral (max) - deg.
FIELD TRIMMING: Trim Coils -
Harmonic Coils -
Other -
CURRENT: Main Coils 185 Amps Stability
Trim Coils - Amps Stability -
Stored Energy (cryogenic) MJ
WEIGHT: Iron 34000 kg Conductor 2000 kg
ION ENERGY: Bending Limit E/A = 19 q^2/A^2 MeV/u
Focusing Limit E/A = 19 q/A MeV/u

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:
Description: RF Cavities in Opposite Valleys
No. of Gaps/turn 4 dE/dn(max) 0.17 MeV/q
Voltage (max) ≃ 0.05 MV Harmonic f_{rf}/f_{ion} 4
Freq ≃ 42 MHz Power in(max) 0.035 MW
Stability: Phase - Voltage 5.10^{-3}

VACUUM SYSTEM

OPERATING PRESSURE: 2.10^{-5} mbar
PUMPS: (No. and type) Two 700 l/s diffusion pumps

ION SOURCE(S)

	Type	Intensity (mA)	@ $\varepsilon_n = \beta\gamma\varepsilon$ (π mm mrad)	Ion Species
(a)	PIG	> 2		$H+$
(b)	-	-	-	-

INJECTION SYSTEM

- Efficiency - %

EXTRACTION SYSTEM

- Efficiency - %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (part. μA) Internal	External
(a) $H+$	< 18	2000	-
(b) -	-	-	-

EXTRACTED BEAM PROPERTIES:
For -μA of - MeV/u - ions
ΔE/E - % $\Delta\phi$ - °rf
$\varepsilon_n = \beta\gamma\varepsilon$ x - π mm mrad z - π mm mrad

REFERENCES/NOTES

(a) Yves Jongen et al., EPAC 1994, London
(b)

NB : INTERNAL TARGETS
DEES CONNECTED AT THE CENTRE