Comparison of Dipoles for NOvA Accelerator Beamlines

David Harding 1/10/2006

	ADC	ADCW	ADCW	CDA	CDAN	
	Booster Dump Line 5' B1 Dipole	Spaced	Spaced+coil	Electron Coling Ring dipole	Pole shimmed	
Assembly drawing	ME-299985			MD-225582		
Lamination drawing	MD-006460					
Coil drawing	ME-023660					
Base gap	1.500	1.500	1.500	3.250	3.250	in
Spacer/shim	0.000	0.620	0.620	0.000	-1.130	in
Gap	1.500	2.120	2.120	3.250	2.120	in
Gap	0.0381	0.0538	0.0538	0.0826	0.0538	m
Pole width	14.530	14.530	14.530	12	12	in
Main Coils	2	2	2	2	2	ea
Turns/coil	20	20	20	20	20	ea
Extra coils	0	0	1	0	0	ea
Turns/coil			5			ea
Total turns	40	40	45	40	40	ea
Transfer function (calculated)	0.001319	0.000933	0.001050	0.000609	0.000933	T/A
Transfer function (calculated)	1.32	0.93	1.05	0.61	0.93	T/kA
Length (steel)	60	60	60	48	48	in
Length (steel)	1.524	1.524	1.524	1.219	1.219	m
Momentum	8.8889	8.8889	8.8889	8.8889	8.8889	GeV/c
B-rho	29.7	29.7	29.7	29.7	29.7	T-m
Bend angle required	**25.0**	25.0	25.0	25.0	25.0	mr
Integrated field required	0.741	0.741	0.741	0.741	0.741	T-m
Field required	0.486	0.486	0.486	0.608	0.608	T
Current required	369	521	463	998	651	A
Resistance (measured+)	34.1	34.1	38.4	25	25	mOhm
Power instantaneous	4.63	9.26	8.23	24.92	10.61	kW
Power duty factor	1.00	1.00	1.00	1.00	1.00	
Power average	4.6	9.3	8.2	24.9	10.6	kW
Pressure drop	100	100	100	100	100	psid
Flow at 100 psid (measured+)	4.65	4.65	4.38	4.96	4.96	gpm
Temperature rise	3.79	7.57	7.14	19.09	8.12	deg C
Water outlet temperature (95 deg F in)	102	109	108	129	110	deg F