

# Typical OMRON PLC Based MADIC Controller Boiler Adjustment Data

Updated on 12/03/2015

Note:

The boiler adjustment data are completely different for different ships

Boiler Adjustment Data

TBL1: Steam Pressure load limit (D4060-D4080)											
X: Steam Pressure (DM 2620 )						Y: FO flow (DM2370)					
Xn	%	PV	DM	BCD 4095	Binary 0FFF	Yn	%	PV	DM	BCD 4095	Binary 0FFF
1	0	0	D4061	4914	1332	1	30.0		D4062	1229	4CD
2	20.4	4.08	D4063	819	333	2	30.0		D4064	1229	4CD
3	25.0	5.0	D4065	1024	400	3	60.0		D4066	2457	999
4	50.0	10.0	D4067	2048	800	4	60.0		D4068	2457	999
5	51.0	10.2	D4069	2088	828	5	110		D4070	4505	1199
6	66.6	13.2	D4071	2727	AA7	6	110		D4072	4505	1199
7	67.0	13.4	D4073	2744	AB8	7	110		D4074	4505	1199
8	120	24.0	D4075	4914	1332	8	110		D4076	4505	1199
9	120	24.0	D4079	4914	1332	9	110		D4078	4505	1199
10	120	24.0	D4081	4914	1332	10	110		D4080	4505	1199
Remarks:											

TBL2: Air Flow load limit (D4085-D4105)											
X: Air Flow (DM2540 )						Y: FO Flow (DM2372)					
Xn	%	PV	DM	BCD 4095	Binary 0FFF	Yn	%	PV	DM	BCD 4095	Binary 0FFF
1	0	0	D4086	4914	1332	1	30.0		D4087	1229	4CD
2	15.0	60	D4088	614	266	2	60.0		D4089	2457	999
3	50.0	200	D4090	2048	800	3	90.0		D4091	3686	E66
4	90.0	360	D4092	3686	E66	4	110		D4093	4505	1199
5	120	480	D4094	4914	1332	5	120		D4095	4914	1332
6	120	480	D4096	4914	1332	6	120		D4097	4914	1332
7	120	480	D4098	4914	1332	7	120		D4099	4914	1332
8	120	480	D4100	4914	1332	8	120		D4101	4914	1332
9	120	480	D4102	4914	1332	9	120		D4103	4914	1332
10	120	480	D4104	4914	1332	10	120		D4105	4914	1332
Remarks:											

TBL3: FO Pressure to Flow Conversion (D4110-D4130)											
X: FO Pressure (DM2622)						Y: FO Flow (DM2374)					
Xn	%	PV	DM	BCD 4095	Binary 0FFF	Yn	%	PV	DM	BCD 4095	Binary 0FFF
1	0		D4111	4914	1332	1	0		D4112	1332	4CD
2	120		D4113	4914	1332	2	120		D4114	1332	999
3	120		D4115	4914	1332	3	120		D4116	1332	E66
4	120		D4117	4914	1332	4	120		D4118	1332	1199
5	120		D4119	4914	1332	5	120		D4120	1332	1332
6	120		D4121	4914	1332	6	120		D4122	1332	1332
7	120		D4123	4914	1332	7	120		D4124	1332	1332
8	120		D4125	4914	1332	8	120		D4126	1332	1332
9	120		D4127	4914	1332	9	120		D4128	1332	1332
10	120		D4129	4914	1332	10	120		D4130	1332	1332
Remarks: Main BNR Constant: D5294 (4095), Small BNR Constant: D5296 ( 4095)											

Boiler Adjustment Data

TBL4: ATM Pressure required (D4135-D4155)											
X: FO Pressure (DM2622)						Y: ATM Pressure (DM2376)					
Xn	%	PV	DM	BCD 4095	Binary 0FFF	Yn	%	PV	DM	BCD 4095	Binary 0FFF
1	0		D4136	4914	1332	1	0		D4137	0	0
2	6.5		D4138	266	10A	2	25.5		D4139	1044	414
3	7.0		D4140	286	11E	3	26.0		D4141	1064	428
4	10.0		D4142	410	19A	4	31.0		D4143	1269	4F5
5	20.0		D4144	819	333	5	49.0		D4145	2007	7D7
6	25.0		D4146	1024	400	6	58.0		D4147	2375	947
7	35.0		D4148	1433	599	7	75.0		D4149	3071	BFF
8	38.7		D4150	1584	630	8	78.0		D4151	3194	C7A
9	43.0		D4152	1761	6E1	9	80.0		D4153	3276	CCC
10	120		D4154	4914	1332	10	80.0		D4155	3276	CCC
Remarks: Typical Data											

TBL5: Main BNR HFO air required (D4160-D4180)											
X: FO Pressure (DM2622)						Y: Air Flow (DM2378)					
Xn	%	PV	DM	BCD 4095	Binary 0FFF	Yn	%	PV	DM	BCD 4095	Binary 0FFF
1	0		D4161	4914	1332	1	10		D4162	246	19A
2	10		D4163	410	19A	2	11		D4164	450	1C2
3	20		D4165	819	333	3	17		D4166	690	2B2
4	30		D4167	1229	4CD	4	31		D4168	1065	429
5	40		D4169	1638	666	5	47		D4170	1638	666
6	50		D4171	2048	800	6	78		D4172	2621	A3D
7	60		D4173	2475	9AB	7	80		D4174	3030	BD6
8	75		D4175	3071	BFF	8	84		D4176	3276	CCC
9	90		D4177	3689	E69	9	84		D4178	3418	D99
10	120		D4179	4914	1332	10	84		D4180	3890	F32
Remarks:											

TBL6: Main BNR 2RY Opening Required (D4185-D4205)											
X: FO Pressure (DM2622)						Y: Damper Opening (DM2380)					
Xn	%	PV	DM	BCD 4095	Binary 0FFF	Yn	%	PV	DM	BCD 4095	Binary 0FFF
1	0		D4186	4914	1332	1	20		D4187	819	333
2	30		D4188	1229	4CD	2	5		D4189	205	CD
3	40		D4190	1638	666	3	0		D4191	0	0
4	50		D4192	2048	800	4	0		D4193	0	0
5	60		D4194	2475	9AB	5	17		D4195	696	2B8
6	70		D4196	2867	B33	6	35		D4197	1433	599
7	80		D4198	3276	CCC	7	50		D4199	2048	800
8	90		D4200	3689	E69	8	65		D4201	2662	A66
9	100		D4202	4095	FFF	9	75		D4203	3071	BFF
10	120		D4204	4914	1332	10	90		D4205	3287	E67
Remarks:											

Boiler Adjustment Data

TBL7: Small BNR HFO air required (D4210-D4230)											
X: FO Pressure (DM2622)						Y: Air flow (DM2382)					
Xn	%	PV	DM	BCD 4095	Binary 0FFF	Yn	%	PV	DM	BCD 4095	Binary 0FFF
1	0		D4211	4914	1332	1	5		D4212	205	CD
2	10		D4213	410	19A	2	5		D4214	205	CD
3	20		D4215	819	333	3	6		D4216	246	F6
4	30		D4217	1229	4CD	4	8		D4218	328	148
5	40		D4219	1638	666	5	12		D4220	491	1E8
6	50		D4221	2048	800	6	19		D4222	778	30A
7	60		D4223	2475	9AB	7	29		D4224	1188	4A4
8	75		D4225	3071	BFF	8	49		D4226	2007	7D7
9	90		D4227	3689	E69	9	59		D4228	2416	970
10	120		D4229	4914	1332	10	82		D4230	3358	D1E
Remarks:											

TBL8: Main BNR Secondary Damper Opening (D4235-D4255)											
X: FO Pressure (DM2622)						Y: Damper Opening (DM2384)					
Xn	%	PV	DM	BCD 4095	Binary 0FFF	Yn	%	PV	DM	BCD 4095	Binary 0FFF
1	0		D4236	4914	1332	1	0		D4237	0	0
2	30		D4238	1229	4CD	2	0		D4239	0	0
3	40		D4240	1638	666	3	0		D4241	0	0
4	50		D4242	2048	800	4	0		D4243	0	0
5	60		D4244	2475	9AB	5	0		D4245	0	0
6	70		D4246	2867	B33	6	0		D4247	0	0
7	80		D4248	3276	CCC	7	0		D4249	0	0
8	90		D4250	3689	E69	8	2		D4251	82	52
9	100		D4252	4095	FFF	9	3.5		D4253	143	8F
10	120		D4254	4914	1332	10	7		D4255	287	11F
Remarks:											

TBL9: Main BNR DO Air Required (D4260-D4280)											
X: FO Pressure (DM2622)						Y: Air Flow (DM2386)					
Xn	%	PV	DM	BCD 4095	Binary 0FFF	Yn	%	PV	DM	BCD 4095	Binary 0FFF
1			D4261			1			D4262		
2			D4253			2			D4254		
3			D4265			3			D4266		
4			D4267			4			D4268		
5			D4269			5			D4270		
6			D4271			6			D4272		
7			D4273			7			D4274		
8			D4275			8			D4276		
9			D4277			9			D4278		
10			D4279			10			D4280		
Remarks:											

Boiler Adjustment Data

TBL10: (D4285-D4305)											
X: FO Pressure (DM2622)						Y: (DM2388)					
Xn	%	PV	DM	BCD 4095	Binary 0FFF	Yn	%	PV	DM	BCD 4095	Binary 0FFF
1			D4286			1			D4287		
2			D4288			2			D4289		
3			D4290			3			D4291		
4			D4292			4			D4293		
5			D4294			5			D4295		
6			D4296			6			D4297		
7			D4298			7			D4299		
8			D4300			8			D4301		
9			D4302			9			D4303		
10			D4304			10			D4305		
Remarks:											

TBL11: Small BNR DO Air Required (D4310-D4330)											
X: FO Pressure (DM2622)						Y: Air Flow (DM2390)					
Xn	%	PV	DM	BCD 4095	Binary 0FFF	Yn	%	PV	DM	BCD 4095	Binary 0FFF
1			D4311			1			D4312		
2			D4313			2			D4314		
3			D4315			3			D4316		
4			D4317			4			D4318		
5			D4319			5			D4320		
6			D4321			6			D4322		
7			D4323			7			D4324		
8			D4325			8			D4326		
9			D4327			9			D4328		
10			D4329			10			D4330		
Remarks:											

Boiler Adjustment Data

Parameter Name	DM (D)	Data (#)	Engineer Value		
Master Controller					
Steam Press Initial Set	D4900	3071	15kg		
MST SP INC/DEC Speed	D4940	5			
MST AUTO RUN Hys	D3780	205	5%		
<b>MST PB</b>	<b>D4820</b>	<b>150</b>	<b>15%</b>		
<b>MST RESET</b>	<b>D4840</b>	<b>300</b>	<b>30 Sec</b>		
MST PID Out low limit	D4860	614	15%		
MST PID Out high limi	D4880	4095	100%		
FO Controller Set Point					
Small BNR IG Load Limit	D5312	900	22%		
Main BNR IG Load Limit	D5310	655	16%		
Non IG Load Limit	D5266	491	12%		
SFT1 Transfer Speed	D4660	1	30 Sec		
Steam Pressure load limit C word	D4060	4008			
DRL1 UP speed	D4700	2756	800%		
	D4701	3			
DRL1 DN speed	D4740	8190	200%		
	D4741	0			
Air Load Limit TBL C word	D4085	4008			
Steaming Up Max load	D5270	4505	110%		
Max load	D5262	4095	100%		
DRL High Speed	D5264	2756	800%		
	D5265	3			
Steaming Up Speed Rate	D5272	61	1.5%		
	D5273	0			
DRL2 DN Speed rate	D5274	8190	200%		
	D5275	0			
FO Controller					
FO PRESS to FLOW TBL C word	D4110	4008			
Small BNR flow constant	D5296	4095	100%		
Main BNR flow constant	D5294	4095	100%		
FOV Closing speed reduce pressure	D5276	819	20%		
FOV Closing speed reduce Hys	D3784	205	5%		
FOV closing Speed @ FO<4K	D5278	205			
<b>FO PB</b>	<b>D4822</b>	<b>750</b>	<b>75%</b>		
<b>FO RESET</b>	<b>D4842</b>	<b>900</b>	<b>90 sec</b>		
FO PID Out Low limit	D4862	0	0%		
FO PID Out High limit	D4882	4095	100%		
DRL3 UP Speed	D4704	2786			
(2 words)	D4705	3			

Boiler Adjustment Data

Parameter Name	DM (D)	Data (#)	Engineer Value		
<b>FO Controller</b>					
<b>Main BNR FO IGN SET</b>	<b>D5314</b>	<b>860</b>	<b>21%</b>		
Main BNR DO IGN SET	D4342	860	21%		
<b>Small BNR FO IGN SET</b>	<b>D5316</b>	<b>410</b>	<b>10%</b>		
Small BNR DO IGN SET	D4340	410	10%		
FOV Circulation Opening	D5282	1843	45%		
SFT2 transfer speed	D4662	50			
SFT3 transfer speed	D4664	50			
FO MANU INC/DEC speed	D4980	8			
<b>BNR ON/OFF</b>					
Auto Steaming Up condition SP	D5268	1024	P>5k		
Auto Steaming Up condition Hys	D3782	0			
FO IGN RATE Error SP	D3920	205		Set+/-5%	
FO IGN RATE Error Hys	D3990	0			
FO Pressure High SP	D5284	1843	P>10k		
FO Pressure High Hys	D3854	0			
Idle Set (for various items)	D5260	0			
<b>BNR ON @ ECO mode SP</b>	<b>D5302</b>	<b>1229</b>	<b>30%</b>	<b>ON: 6k</b>	
<b>BNR ON @ Normal mode</b>	<b>D5300</b>	<b>2457</b>	<b>60%</b>	<b>ON: 12k</b>	
<b>ECO BNR OFF Hys</b>	<b>D5306</b>	<b>614</b>	<b>15%</b>	<b>OFF: 9k</b>	
<b>Normal BNR OFF Hys</b>	<b>D5304</b>	<b>880</b>	<b>21.5%</b>	<b>OFF: 16.3k</b>	
<b>Atomizing Steam Controller</b>					
TBL4 ATM pressure required C word	D4135	4008			
FO IGN time ATM SP	D5308	1822	44.5%		
<b>ATM PB</b>	<b>D4828</b>	<b>550</b>	<b>55%</b>		
<b>ATM RESET</b>	<b>D4848</b>	<b>180</b>	<b>18 sec</b>		
ATM PID Out low limit	D4868	0			
ATM PID Out high Limit	D4888	4095			
ATM Control SP-PV MS SP	D3922	274	6.7%		
ATM Control SP-PV MS Hys	D3992	41	1%		
<b>Secondary Damper Controller</b>					
TBL6 Main BNR C word	D4185	4008			
TBL 8 Small BNR C word	D4235	4008			
2RY Furnace Purge Set	D5286	4095	100%		
2RY IGN SET (Both Main & Small)	D5288	205	5		
SFT5 transfer speed	D4668	50			
DRL7 DN speed for IGN or PG	D5292	8190			
(2 words)	D5293	0			

Boiler Adjustment Data

Parameter Name	DM (D)	Data (#)	Engineer Value	
<b>Secondary Damper Controller</b>				
DRL7 normal DN speed	D5290	2756		
(2 words)	D5291	3		
DRL7 UP Speed	D4712	2756		
(2 words)	D4713	3		
<b>Air Controller Set Point –Differential Component</b>				
LAG7 Time	D4792	60	6 sec	
FO SP ratio	D3622	4095		
FO PV (Lagged) ratio	D3682	4095		
Differential Low limit	D3762	0		use UP only
Differential component percentage	D3564	4914	120%	
(Pressure+ Extra) component percentage	D3504	4095	100%	
<b>Air Controller Set Point –FO pressure component</b>				
TBL5 Main BNR FO Air SP C word	D4160	4008		
TBL7 Small BNR FO Air SP C word	D4210	4008		
TBL9 Main BNR DO Air SP C word	D4260	4008		
TBL11 Small BNR DO Air SP C word	D4310	4008		
Min FO/AIR ratio	D3500	2048		
Power up time FO/AIR ratio	D4902	2048	1.0	After add Min.
Air Ratio INC/DEC speed	D4942	10		
Extra ratio start point, SUB H2	D5320	2048	1.0	1.0
Extra ratio SUB, P1	D3620	4095		
Extra ratio SUB, P2	D3680	4095		
LSE, H2	D3760	0		Only A/R>1.0
Pressure component percentage	D3502	4095	100%	
Extra ratio percentage	D3562	819	20%	
<b>FD Fan High Run Order/ Air Controller PB selector</b>				
FDF High RUN SP, small BNR	D5350	1536	>150mm	
FDF High RUN SP, main BNR	D5348	1536	>150mm	
FDF High RUN Hys, small BNR	D5354	819	<70mm	
FDF High RUN Hys, main BNR	D5352	819	<70mm	
High draft MS SP	D5332	2048	>200mm	
High draft MS Hys	D3794	205	<180mm	
<b>PB @FDF Low RUN</b>	<b>D5336</b>	<b>4333</b>	<b>350%</b>	
	<b>D5337</b>	<b>1</b>		
<b>PB @FDF High RUN</b>	<b>D5338</b>	<b>4333</b>	<b>350%</b>	
	<b>D5339</b>	<b>1</b>		
<b>PB @High Draft Loss</b>	<b>D5346</b>	<b>4333</b>	<b>350%</b>	
	<b>D5347</b>	<b>1</b>		



Boiler Adjustment Data

Parameter Name	DM (D)	Data (#)	Engineer Value		
<b>Air Flow Controller</b>					
Air PID SP DRL normal DN speed	D5322	0238	250%		
	D5323	1			
Air PID SP DRL IGN/PG DN speed	D5264	2756	800%	Share	
	D5265	3			
Air PID SP DRL IGN/PG UP speed	D4706	2756	800%		
	D4707	3			
Air PB (Selected)	D4824				
<b>Air RESET</b>	<b>D4844</b>	<b>60</b>	<b>6 Sec</b>		
PID Out low limit	D4864	0			
PID out high limit	D4884	4095			
<b>Air IGN SET/AIR PURGE SET</b>					
<b>Small BNR AIR IGN SET (FO)</b>	<b>D5326</b>	<b>164</b>	<b>4.0%</b>		
Small BNR AIR IGN SET (DO)	D4336	164	4.0%		
<b>Main BNR AIR IGN SET (FO)</b>	<b>D5318</b>	<b>205</b>	<b>5.5%</b>		
Main BNR AIR IGN SET (DO)	D4338	205	5.5%		
<b>Furnace purge air set</b>	<b>D5324</b>	<b>4095</b>	<b>100%</b>		
Air IGN/PG UP rate (DRL#5)	D4708	4507	600%		
	D4709	2			
Air IGN/PG DN rate (DRL #5)	D4748	4507	600%		
	D4749	2			
Normal/IGN_PG SFT transfer speed	D4666	50			
<b>Air Manu Control</b>					
Manu INC/DEC speed	D4982	8			
<b>Air purge rate/Air IGN rate Monitoring</b>					
Purge rate SP	D5328	1536			
Purge rate Hys	D3790	205			
Air IGN rate SP	D5330	360	35mm		
Air IGN rate Error SP	D3924	240	+/-24mm		
Air IGN rate Error Hys	D3994	61	+/-6mm		
<b>Note: Air IGN rate ok flag: Capture: 35+/- 19mm, Stay 35+/-24mm</b>					

Boiler Adjustment Data

Parameter Name	DM (D)	Data (#)	Engineer Value		
Drum Water Level Controller					
S.D Level Initial Set	D4904	2048	50%		
FWC SP INC/DEC speed	D4944	10			
<b>FWC ECO mode PB</b>	<b>D5342</b>	<b>819</b>	<b>20%</b>		
<b>FWC NOR mode PB</b>	<b>D5340</b>	<b>1207</b>	<b>30%</b>		
<b>FWC RESET</b>	<b>D4846</b>	<b>750</b>	<b>75 sec</b>		
PID Out low limit	D4866	0			
PID Out high limit	D4886	4095			
FWC Mnau INC/DEC speed	D4984	8			
<b>Drum Level Low-Low SP</b>	<b>D5344</b>	<b>410</b>	<b>10%</b>		
Drum Level Low-Low Hys	D3852	0			
Controller Abnormal Monitoring					
Master SP-PV tolerance SP	D3926	819	4k		
Master SP-PV tolerance Hys	D3996	0			
FO SP-PV tolerance SP	D3928	1229	6.4k		
FO SP-PV tolerance Hys	D3998	0			
FO answer back Manu timer	D5040	30			
FO answer back not run timer	D5080	30			
Air SP-PV tolerance SP	D3930	1229			
Air SP-PV tolerance Hys	D4000	0			
Air answer back Manu timer	D5042	30			
Air answer back not run timer	D5082	30			
FWC SP-PV tolerance SP	D3934	2048			
FWC SP-PV tolerance Hys	D4004	0			
FWC answer back Manu timer	D5044	30			
FWC answer back not run timer	D5084	30			
Input Lags Time Constant					
Master steam Tx lag	D4780	15			
FO pressure Tx lag	D4782	10			
Atomizing steam Tx lag	D4784	15			
Air flow Tx lag	D4786	10			
Drum Level Tx lag for Normal mode	D4788	15			
Drum Level Tx lag for ECO mode	D4790	50			
FO SP Differential	D4792	60			