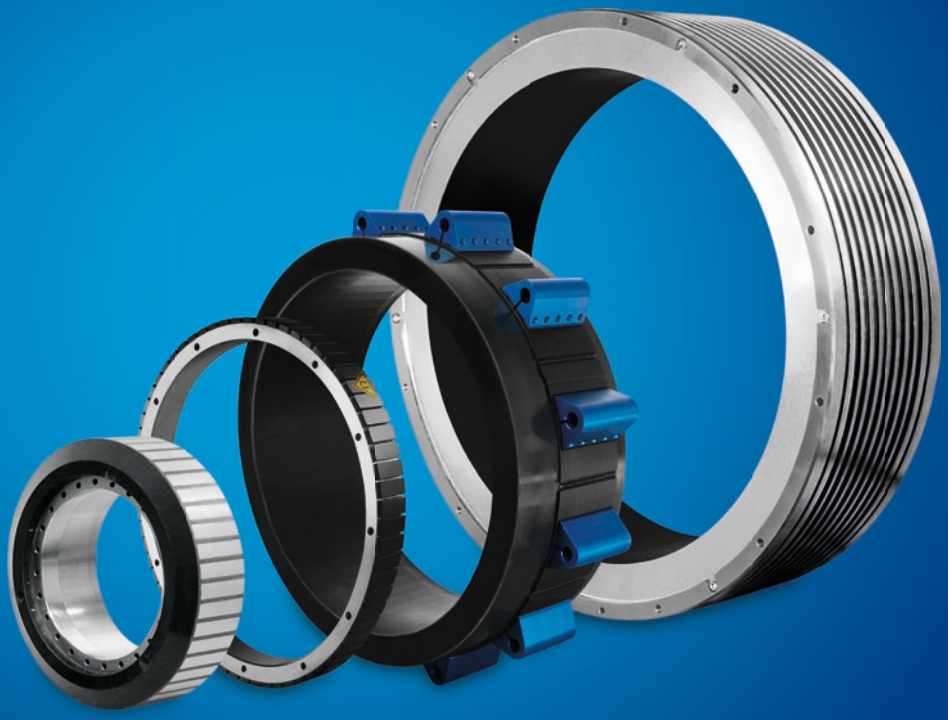

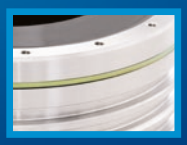

Torque **Motors**

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0140-030

MOTOR PERFORMANCE		Winding codes	RA	SA	SB	UB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	39.6	39.6	39.6	39.5
Ti	Intermittent torque	Nm	29.5	29.1	29.1	28.0
Tc	Continuous torque	Nm	21.6	21.3	21.3	20.3
Ts	Standstill torque	Nm	17.3	17.0	17.0	16.2
Ip	Peak current	Arms	15.8	20.6	41.2	73.0
Ii	Intermittent current	Arms	9.57	12.2	24.4	40.8
Ic	Continuous current	Arms	6.06	7.73	15.5	25.8
Is	Standstill current	Arms	4.59	5.86	11.7	19.5
ns	Rated low speed	rpm	0.75	0.75	0.75	0.78
nm	Maximum speed without flux weakening	rpm	1570	2060	4120	4590
nm,FW	Maximum speed with flux weakening	rpm	3570	4010	4590	4590
τon,p	Maximum ON time for peak cycle	s	6.4	5.9	5.9	4.7
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	3480	3610	3610	4070
Pi	Power dissipation @ Ii	W	1630	1610	1610	1580
Pc	Power dissipation @ Ic	W	652	643	643	633
Td	Max. detent torque (average to peak)	Nm	0.32	0.32	0.32	0.32

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	4.35	3.33	1.67	0.940
Ku	Back EMF constant (*)	Vrms/(rad/s)	2.52	1.93	0.965	0.545
Km	Motor constant	Nm/√W	1.23	1.21	1.21	1.15
R20	Electrical resistance at 20°C (*)	Ohm	8.32	5.03	1.26	0.446
Ld/Lq	Electrical inductance (*)	mH	56.6 / 49.3	33.2 / 29.1	8.29 / 7.29	2.64 / 2.37
Isc	Maximum short-circuit current	Arms	4.67	6.11	12.2	21.6
nb	Base speed	rpm	1280	1730	3950	N/A
nb,i	Base speed at intermittent duty cycle	rpm	1030	1430	3300	N/A
nb,p	Base speed at peak duty cycle	rpm	691	945	2030	3670
nn	Rated speed	rpm	1150	1570	2510	2470
Tn	Rated torque	Nm	12.2	10.9	8.32	8.32
In	Rated current	Arms	3.32	3.93	6.25	11.1
τth	Thermal time constant	s	72.9	72.3	72.3	69.9
Rth	Thermal resistance	K/W	0.163	0.165	0.165	0.167
2p	Number of poles	-	22	22	22	22
J	Rotor inertia	kg·m²	0.000993	0.000993	0.000993	0.000993
mr	Rotor mass	kg	0.708	0.708	0.708	0.708
ms	Stator mass	kg	4.73	4.71	4.71	4.67

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.018	0.018	0.018	0.018
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	2.0	2.0	2.0	2.0
Δpw	Max. pressure drop at qw	bar	0.1	0.1	0.1	0.1

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
Please refer to ETEL Integration Manual for the mass of the optional cooling jacket and the possible additional pressure drop.

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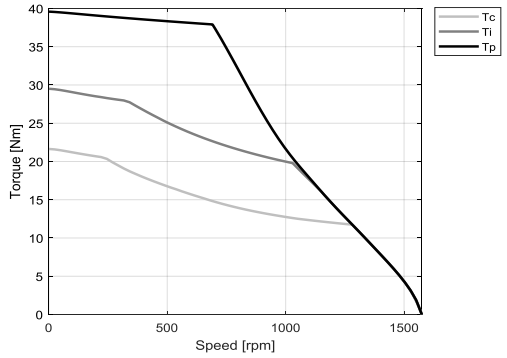
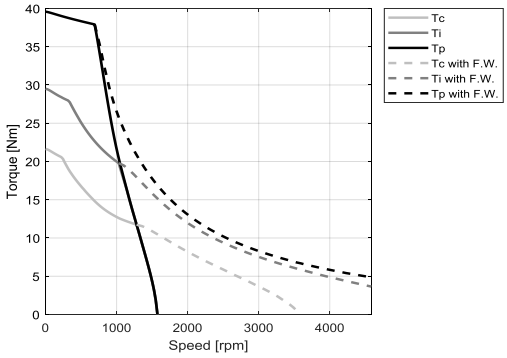
CONVENTIONAL TORQUE MOTOR TMB+0140-030

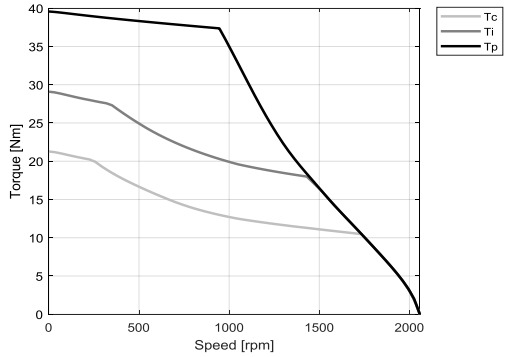
RA - WATER COOLING



RA - WATER COOLING



SA - WATER COOLING



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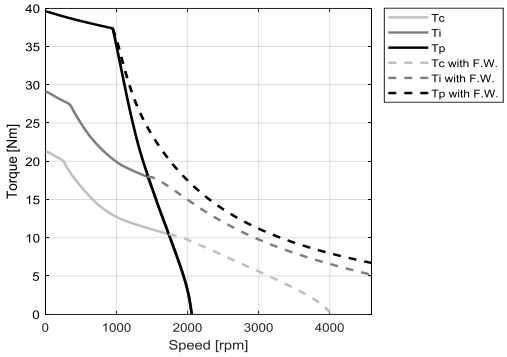
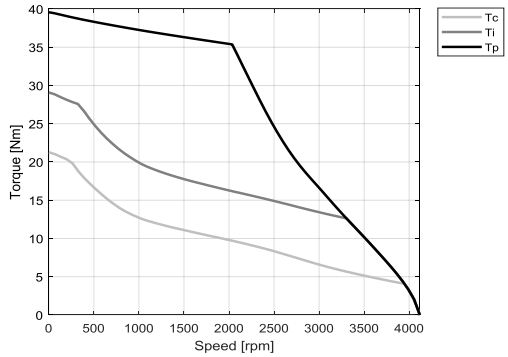


SB - WATER COOLING



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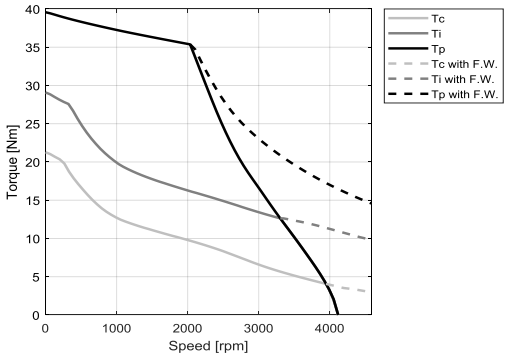
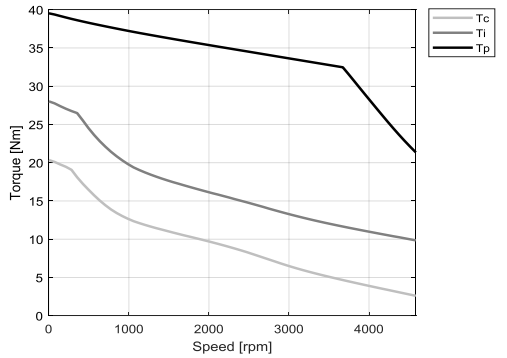


UB - WATER COOLING



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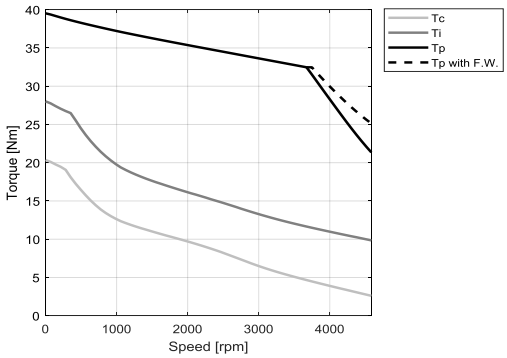

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CONVENTIONAL TORQUE MOTOR TMB+0140-050

MOTOR PERFORMANCE		Winding codes	RA	SA	SB	UB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	66.1	66.1	66.1	66.1
Ti	Intermittent torque	Nm	53.1	52.4	52.4	50.5
Tc	Continuous torque	Nm	38.7	38.1	38.1	36.4
Ts	Standstill torque	Nm	30.9	30.3	30.3	28.8
Ip	Peak current	Arms	14.0	18.3	36.7	65.0
Ii	Intermittent current	Arms	10.1	12.9	25.8	43.1
Ic	Continuous current	Arms	6.39	8.16	16.3	27.3
Is	Standstill current	Arms	4.84	6.19	12.4	20.7
ns	Rated low speed	rpm	0.84	0.84	0.84	0.87
nm	Maximum speed without flux weakening	rpm	947	1240	2480	4390
nm,FW	Maximum speed with flux weakening	rpm	2160	2540	3850	4590
τon,p	Maximum ON time for peak cycle	s	9.1	8.5	8.5	6.8
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	2.9	2.8
Pp	Power dissipation @ Ip	W	3780	3910	3910	4380
Pi	Power dissipation @ Ii	W	2560	2530	2530	2490
Pc	Power dissipation @ Ic	W	1020	1010	1010	996
Td	Max. detent torque (average to peak)	Nm	0.53	0.53	0.53	0.53

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	7.27	5.57	2.78	1.57
Ku	Back EMF constant (*)	Vrms/(rad/s)	4.19	3.21	1.60	0.906
Km	Motor constant	Nm/√W	1.73	1.70	1.70	1.62
R20	Electrical resistance at 20°C (*)	Ohm	11.8	7.12	1.78	0.629
Ld/Lq	Electrical inductance (*)	mH	87.7 / 75.4	51.4 / 44.5	12.9 / 11.1	4.10 / 3.62
Isc	Maximum short-circuit current	Arms	5.02	6.55	13.1	23.2
nb	Base speed	rpm	764	1040	2310	N/A
nb,i	Base speed at intermittent duty cycle	rpm	604	868	1990	3830
nb,p	Base speed at peak duty cycle	rpm	414	580	1290	2350
nn	Rated speed	rpm	682	946	2050	2010
Tn	Rated torque	Nm	21.6	19.0	12.3	12.4
In	Rated current	Arms	3.43	3.97	5.43	9.68
τth	Thermal time constant	s	65.1	64.6	64.6	62.6
Rth	Thermal resistance	K/W	0.102	0.104	0.104	0.105
2p	Number of poles	-	22	22	22	22
J	Rotor inertia	kg·m²	0.00168	0.00168	0.00168	0.00168
mr	Rotor mass	kg	1.20	1.20	1.20	1.20
ms	Stator mass	kg	6.34	6.32	6.32	6.26

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.025	0.025	0.025	0.025
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	3.2	3.2	3.2	3.1
Δpw	Max. pressure drop at qw	bar	0.1	0.1	0.1	0.1

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
Please refer to ETEL Integration Manual for the mass of the optional cooling jacket and the possible additional pressure drop.

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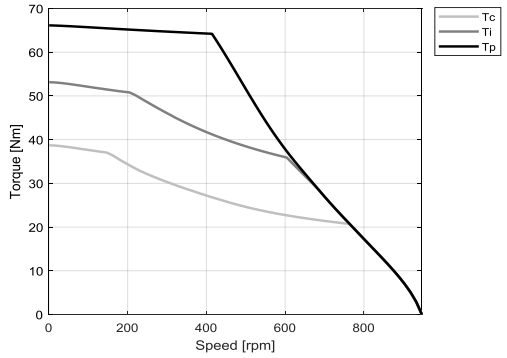
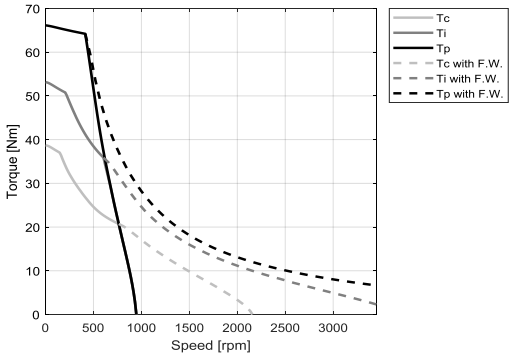
CONVENTIONAL TORQUE MOTOR TMB+0140-050

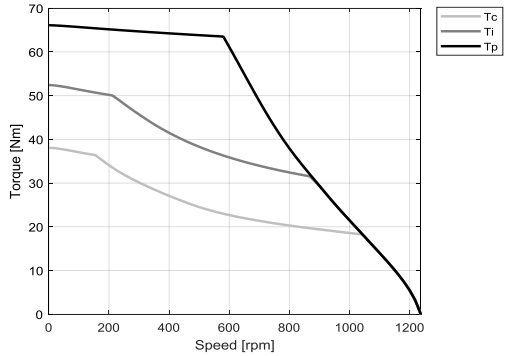
RA - WATER COOLING



RA - WATER COOLING



SA - WATER COOLING



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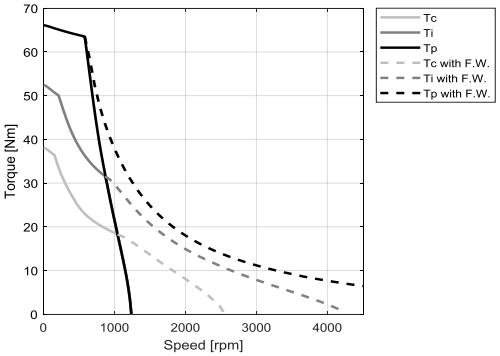
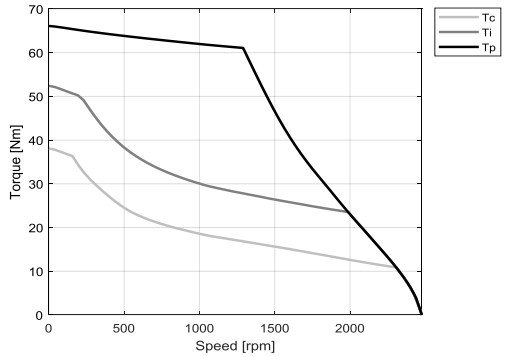


SB - WATER COOLING



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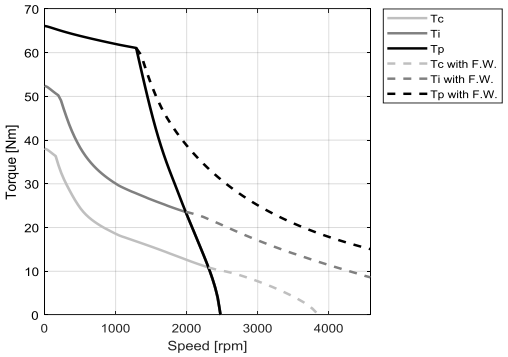
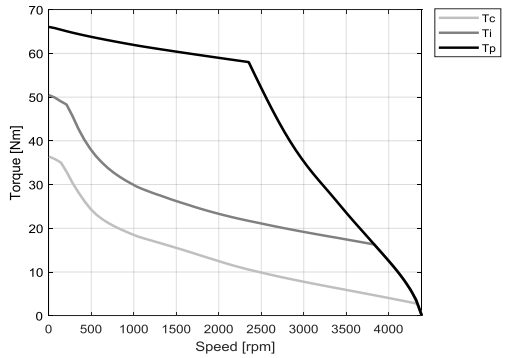
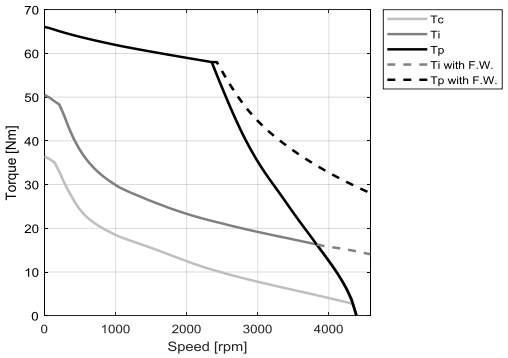


UB - WATER COOLING



UB - WATER COOLING



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CONVENTIONAL TORQUE MOTOR TMB+0140-070

		Winding codes	RA	TA	SB	UB
MOTOR PERFORMANCE		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	92.6	92.6	92.6	92.5
Ti	Intermittent torque	Nm	76.2	74.9	75.2	72.4
Tc	Continuous torque	Nm	55.4	54.3	54.6	52.2
Ts	Standstill torque	Nm	44.2	43.2	43.4	41.3
Ip	Peak current	Arms	13.6	23.0	35.6	63.1
Ii	Intermittent current	Arms	10.3	16.8	26.3	43.9
Ic	Continuous current	Arms	6.49	10.6	16.6	27.7
Is	Standstill current	Arms	4.92	8.06	12.6	21.0
ns	Rated low speed	rpm	0.86	0.87	0.87	0.89
nm	Maximum speed without flux weakening	rpm	676	1140	1770	3140
nm,FW	Maximum speed with flux weakening	rpm	1440	2050	2780	3930
τon,p	Maximum ON time for peak cycle	s	9.8	8.8	9.1	7.3
τon,i	Maximum ON time for intermittent cycle	s	2.8	2.8	2.8	2.8
Pp	Power dissipation @ Ip	W	4590	4840	4750	5300
Pi	Power dissipation @ Ii	W	3420	3400	3380	3330
Pc	Power dissipation @ Ic	W	1370	1360	1350	1330
Td	Max. detent torque (average to peak)	Nm	0.75	0.75	0.75	0.75

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	10.2	6.06	3.90	2.20
Ku	Back EMF constant (*)	Vrms/(rad/s)	5.87	3.48	2.25	1.27
Km	Motor constant	Nm/√W	2.13	2.08	2.10	1.99
R20	Electrical resistance at 20°C (*)	Ohm	15.3	5.66	2.31	0.815
Ld/Lq	Electrical inductance (*)	mH	116 / 99.5	41.0 / 35.4	17.0 / 14.7	5.43 / 4.77
Isc	Maximum short-circuit current	Arms	5.30	8.93	13.9	24.5
nb	Base speed	rpm	537	995	1650	3070
nb,i	Base speed at intermittent duty cycle	rpm	413	852	1450	2740
nb,p	Base speed at peak duty cycle	rpm	276	556	938	1730
nn	Rated speed	rpm	475	909	1540	2100
Tn	Rated torque	Nm	31.7	24.1	16.8	12.6
In	Rated current	Arms	3.54	4.61	5.17	7.21
τth	Thermal time constant	s	63.6	62.8	63.0	61.2
Rth	Thermal resistance	K/W	0.0756	0.0760	0.0765	0.0775
2p	Number of poles	-	22	22	22	22
J	Rotor inertia	kg·m²	0.00236	0.00236	0.00236	0.00236
mr	Rotor mass	kg	1.69	1.69	1.69	1.69
ms	Stator mass	kg	8.18	8.15	8.16	8.08

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.033	0.033	0.033	0.033
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	4.3	4.2	4.2	4.2
Δpw	Max. pressure drop at qw	bar	0.1	0.1	0.1	0.1

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
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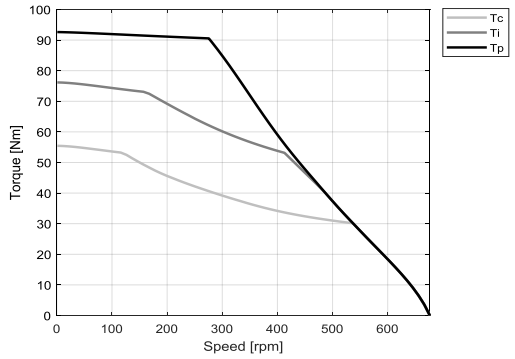
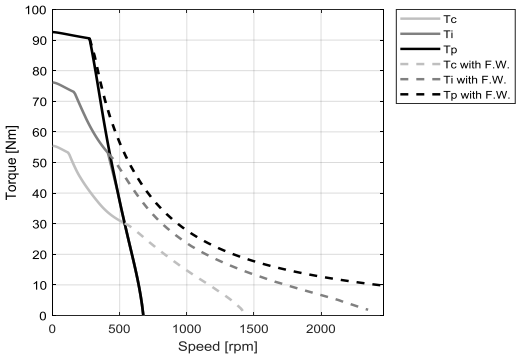
CONVENTIONAL TORQUE MOTOR TMB+0140-070

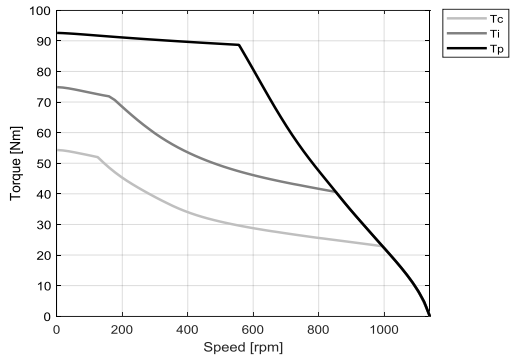
RA - WATER COOLING



RA - WATER COOLING



TA - WATER COOLING



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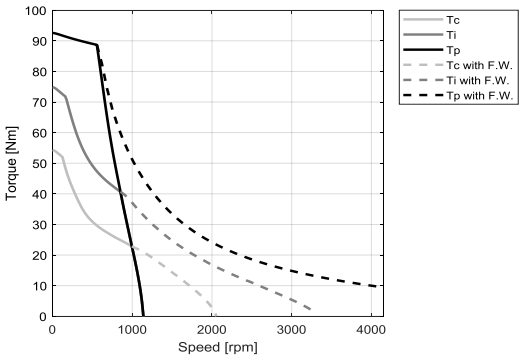
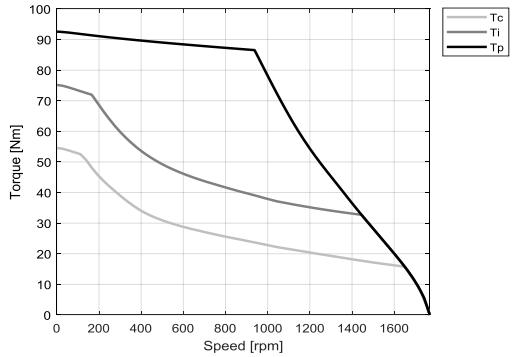
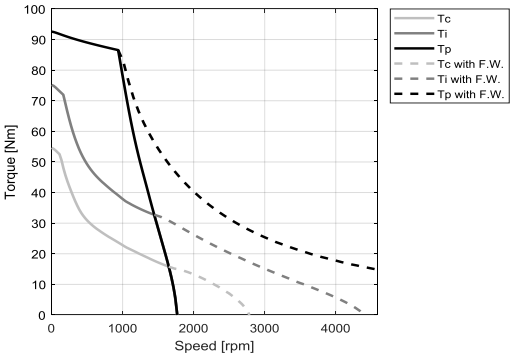


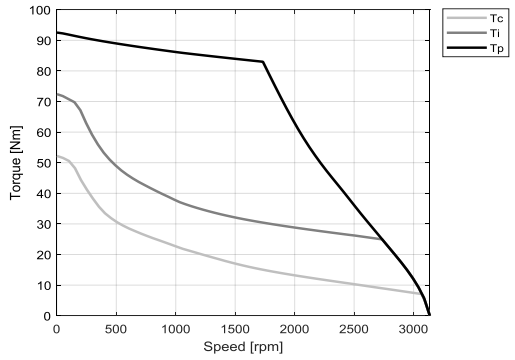
SB - WATER COOLING



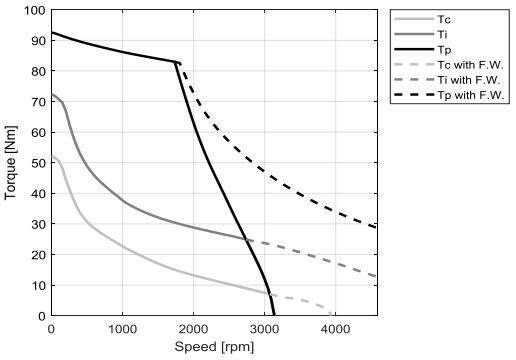
SB - WATER COOLING



UB - WATER COOLING



UB - WATER COOLING



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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0140-100

MOTOR PERFORMANCE		Winding codes	RA	TA	SB	UB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	132	132	132	132
Ti	Intermittent torque	Nm	111	109	109	105
Tc	Continuous torque	Nm	80.9	79.2	79.6	76.2
Ts	Standstill torque	Nm	64.5	63.0	63.4	60.3
Ip	Peak current	Arms	13.4	22.6	35.0	62.0
Ii	Intermittent current	Arms	10.4	17.1	26.7	44.6
Ic	Continuous current	Arms	6.60	10.8	16.9	28.2
Is	Standstill current	Arms	5.00	8.19	12.8	21.4
ns	Rated low speed	rpm	0.91	0.92	0.92	0.94
nm	Maximum speed without flux weakening	rpm	473	798	1240	2190
nm,FW	Maximum speed with flux weakening	rpm	1010	1490	2080	3220
τon,p	Maximum ON time for peak cycle	s	9.9	8.9	9.1	7.3
τon,i	Maximum ON time for intermittent cycle	s	2.8	2.8	2.8	2.8
Pp	Power dissipation @ Ip	W	5960	6270	6160	6860
Pi	Power dissipation @ Ii	W	4750	4700	4690	4600
Pc	Power dissipation @ Ic	W	1900	1880	1880	1840
Td	Max. detent torque (average to peak)	Nm	1.1	1.1	1.1	1.1

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	14.6	8.66	5.59	3.15
Ku	Back EMF constant (*)	Vrms/(rad/s)	8.38	4.98	3.21	1.81
Km	Motor constant	Nm/√W	2.62	2.56	2.58	2.46
R20	Electrical resistance at 20°C (*)	Ohm	20.7	7.63	3.12	1.10
Ld/Lq	Electrical inductance (*)	mH	157 / 134	55.5 / 47.9	23.1 / 19.8	7.35 / 6.45
Isc	Maximum short-circuit current	Arms	5.59	9.42	14.6	25.9
nb	Base speed	rpm	353	674	1120	2090
nb,i	Base speed at intermittent duty cycle	rpm	221	570	994	1880
nb,p	Base speed at peak duty cycle	rpm	157	368	651	1230
nn	Rated speed	rpm	299	611	1040	1970
Tn	Rated torque	Nm	53.1	38.9	29.6	19.7
In	Rated current	Arms	4.15	5.12	6.18	7.71
τth	Thermal time constant	s	59.9	59.2	59.4	57.8
Rth	Thermal resistance	K/W	0.0533	0.0536	0.0539	0.0546
2p	Number of poles	-	22	22	22	22
J	Rotor inertia	kg·m²	0.00334	0.00334	0.00334	0.00334
mr	Rotor mass	kg	2.38	2.38	2.38	2.38
ms	Stator mass	kg	10.5	10.4	10.5	10.4

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.044	0.044	0.044	0.044
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	5.9	5.9	5.9	5.7
Δpw	Max. pressure drop at qw	bar	0.3	0.3	0.3	0.3

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
Please refer to ETEL Integration Manual for the mass of the optional cooling jacket and the possible additional pressure drop.

Caution: Any use of the motor beyond speed/torque limit could lead to hazardous voltage and serious injuries. Customer is responsible for setting safeties/limitations that will keep the motor in its safe operating area. ETEL cannot be held responsible if the motor is used in an improper way.

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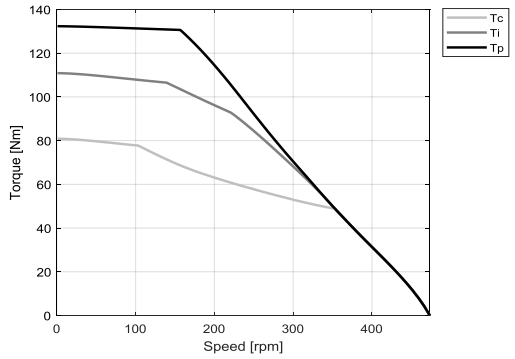
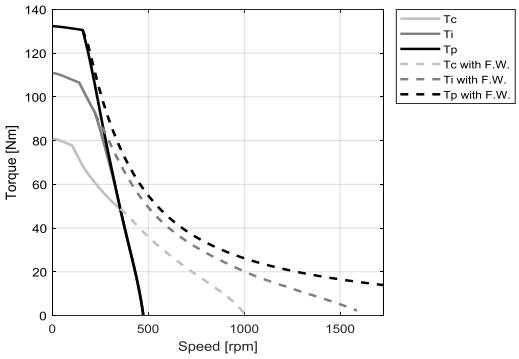
CONVENTIONAL TORQUE MOTOR TMB+0140-100

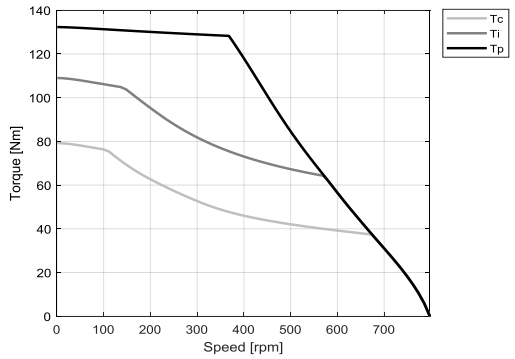
RA - WATER COOLING



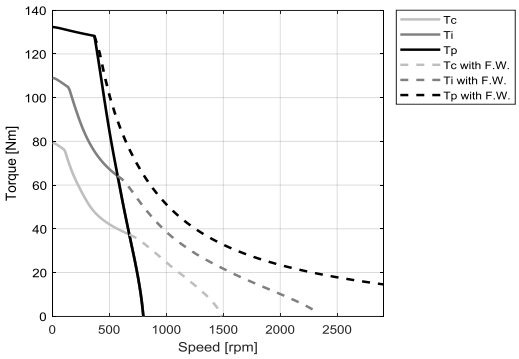
RA - WATER COOLING



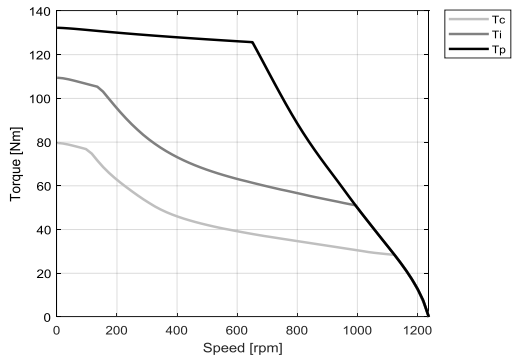
TA - WATER COOLING



TA - WATER COOLING



SB - WATER COOLING



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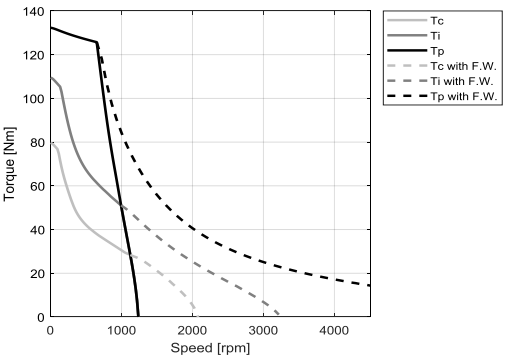
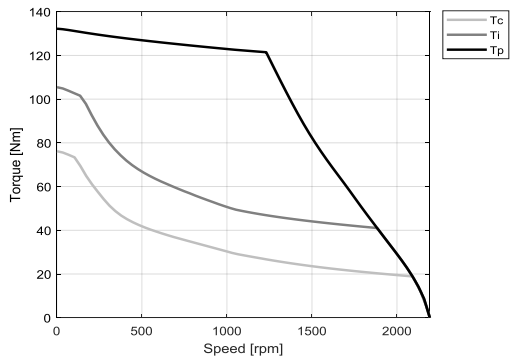


UB - WATER COOLING



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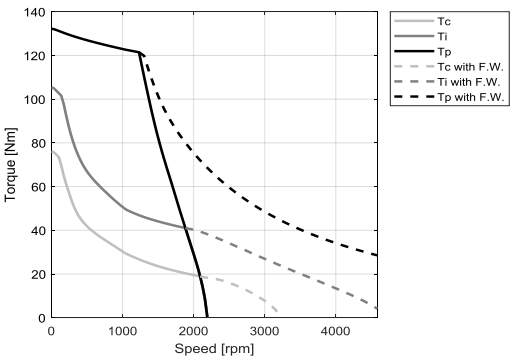

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0140-150

MOTOR PERFORMANCE		Winding codes	RA	TA	SB	UB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	199	198	198	198
Ti	Intermittent torque	Nm	166	163	164	158
Tc	Continuous torque	Nm	121	118	119	114
Ts	Standstill torque	Nm	96.2	94.0	94.6	89.9
Ip	Peak current	Arms	13.2	22.2	34.4	60.9
Ii	Intermittent current	Arms	10.3	16.9	26.4	44.0
Ic	Continuous current	Arms	6.52	10.7	16.7	27.8
Is	Standstill current	Arms	4.94	8.09	12.6	21.1
ns	Rated low speed	rpm	0.90	0.91	0.91	0.94
nm	Maximum speed without flux weakening	rpm	316	532	825	1460
nm,FW	Maximum speed with flux weakening	rpm	720	1040	1460	2290
τon,p	Maximum ON time for peak cycle	s	9.0	8.0	8.3	6.5
τon,i	Maximum ON time for intermittent cycle	s	2.7	2.7	2.7	2.7
Pp	Power dissipation @ Ip	W	8290	8710	8560	9520
Pi	Power dissipation @ Ii	W	6590	6520	6510	6360
Pc	Power dissipation @ Ic	W	2640	2610	2600	2540
Td	Max. detent torque (average to peak)	Nm	1.6	1.6	1.6	1.6

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	21.9	13.0	8.39	4.73
Ku	Back EMF constant (*)	Vrms/(rad/s)	12.6	7.47	4.81	2.72
Km	Motor constant	Nm/√W	3.28	3.20	3.23	3.07
R20	Electrical resistance at 20°C (*)	Ohm	29.8	11.0	4.50	1.58
Ld/Lq	Electrical inductance (*)	mH	234 / 201	82.4 / 71.4	34.2 / 29.6	10.9 / 9.62
Isc	Maximum short-circuit current	Arms	5.65	9.51	14.8	26.1
nb	Base speed	rpm	175	419	713	1360
nb,i	Base speed at intermittent duty cycle	rpm	38.9	316	613	1220
nb,p	Base speed at peak duty cycle	rpm	42.4	200	399	790
nn	Rated speed	rpm	119	369	651	1280
Tn	Rated torque	Nm	110	68.9	54.8	36.3
In	Rated current	Arms	6.02	5.96	7.45	9.05
τth	Thermal time constant	s	60.3	59.7	59.7	58.3
Rth	Thermal resistance	K/W	0.0365	0.0367	0.0369	0.0374
2p	Number of poles	-	22	22	22	22
J	Rotor inertia	kg·m²	0.00506	0.00506	0.00506	0.00506
mr	Rotor mass	kg	3.61	3.61	3.61	3.61
ms	Stator mass	kg	15.1	15.1	15.1	14.9

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.063	0.063	0.063	0.063
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	8.2	8.1	8.1	7.9
Δpw	Max. pressure drop at qw	bar	0.4	0.4	0.4	0.4

Notes: (*) terminal to terminal.
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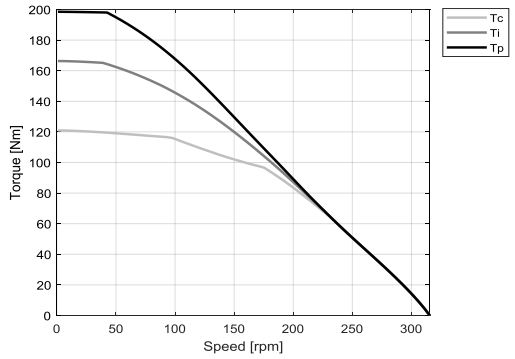
CONVENTIONAL TORQUE MOTOR TMB+0140-150

RA - WATER COOLING



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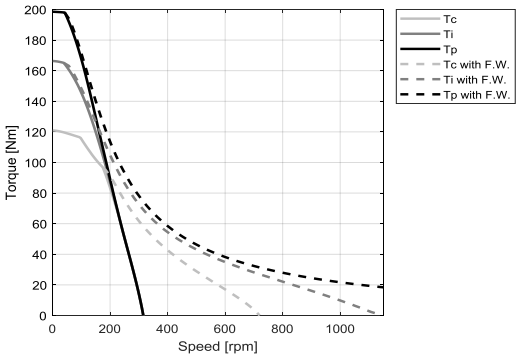
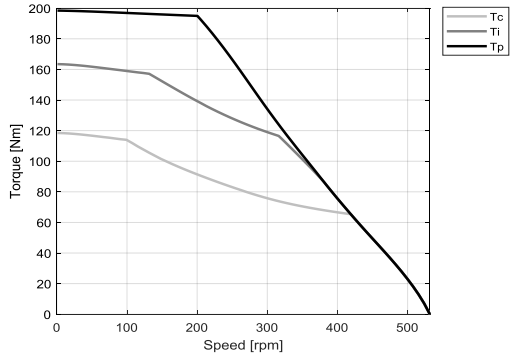


TA - WATER COOLING



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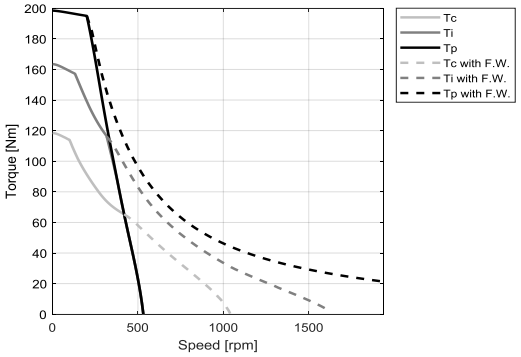
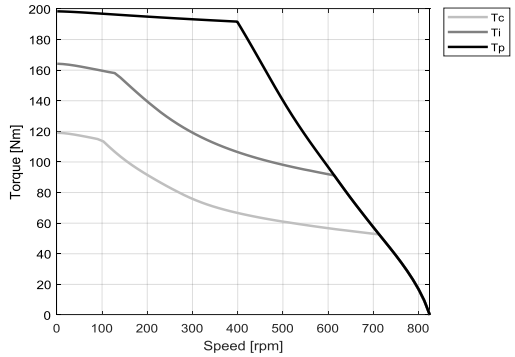
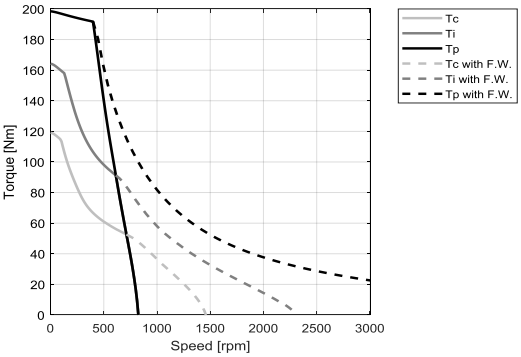


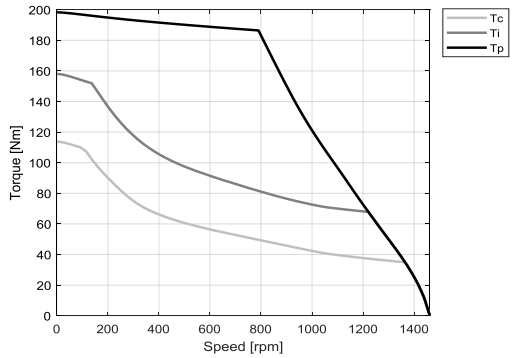
SB - WATER COOLING



SB - WATER COOLING



UB - WATER COOLING



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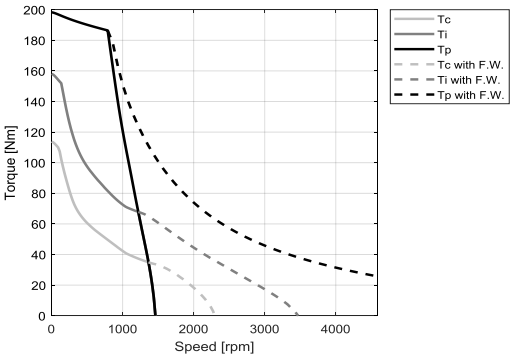

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0140-200

MOTOR PERFORMANCE		Winding codes	RA	TA	SB	UB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	247	265	265	264
Ti	Intermittent torque	Nm	211	216	217	209
Tc	Continuous torque	Nm	159	156	157	150
Ts	Standstill torque	Nm	126	124	124	118
Ip	Peak current	Arms	11.6	22.0	34.1	60.4
Ii	Intermittent current	Arms	9.38	16.5	25.8	43.0
Ic	Continuous current	Arms	6.38	10.5	16.3	27.2
Is	Standstill current	Arms	4.84	7.92	12.4	20.6
ns	Rated low speed	rpm	0.92	0.93	0.93	0.95
nm	Maximum speed without flux weakening	rpm	237	399	619	1100
nm,FW	Maximum speed with flux weakening	rpm	561	826	1130	1780
τon,p	Maximum ON time for peak cycle	s	11	6.6	6.8	5.3
τon,i	Maximum ON time for intermittent cycle	s	7.2	2.7	2.7	2.7
Pp	Power dissipation @ Ip	W	8300	11200	11100	12300
Pi	Power dissipation @ Ii	W	6730	8070	8070	7840
Pc	Power dissipation @ Ic	W	3270	3230	3230	3140
Td	Max. detent torque (average to peak)	Nm	2.1	2.1	2.1	2.1

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	29.2	17.3	11.2	6.32
Ku	Back EMF constant (*)	Vrms/(rad/s)	16.8	9.95	6.42	3.62
Km	Motor constant	Nm/√W	3.81	3.72	3.75	3.57
R20	Electrical resistance at 20°C (*)	Ohm	39.3	14.5	5.92	2.09
Ld/Lq	Electrical inductance (*)	mH	310 / 268	109 / 95.4	45.4 / 39.5	14.5 / 12.8
Isc	Maximum short-circuit current	Arms	5.68	9.56	14.8	26.3
nb	Base speed	rpm	67.8	287	512	1000
nb,i	Base speed at intermittent duty cycle	rpm	0.00	123	423	885
nb,p	Base speed at peak duty cycle	rpm	0.00	107	267	564
nn	Rated speed	rpm	45.5	237	461	927
Tn	Rated torque	Nm	157	110	81.5	56.4
In	Rated current	Arms	6.37	7.18	8.22	10.3
τth	Thermal time constant	s	59.5	58.9	58.9	57.6
Rth	Thermal resistance	K/W	0.0275	0.0276	0.0277	0.0281
2p	Number of poles	-	22	22	22	22
J	Rotor inertia	kg·m²	0.00679	0.00679	0.00679	0.00679
mr	Rotor mass	kg	4.85	4.85	4.85	4.85
ms	Stator mass	kg	19.5	19.4	19.4	19.2

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.080	0.080	0.080	0.080
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	10	10	10	9.8
Δpw	Max. pressure drop at qw	bar	0.9	0.9	0.9	0.9

Notes: (*) terminal to terminal.
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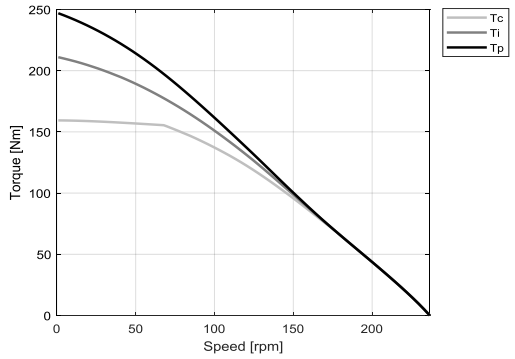
CONVENTIONAL TORQUE MOTOR TMB+0140-200

RA - WATER COOLING



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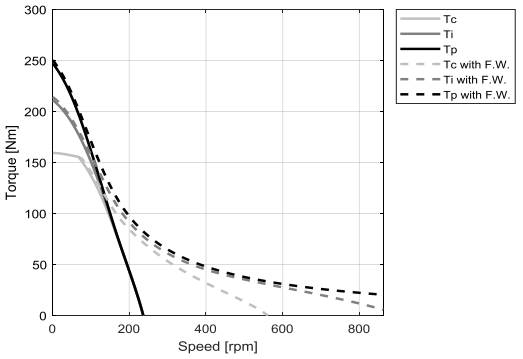
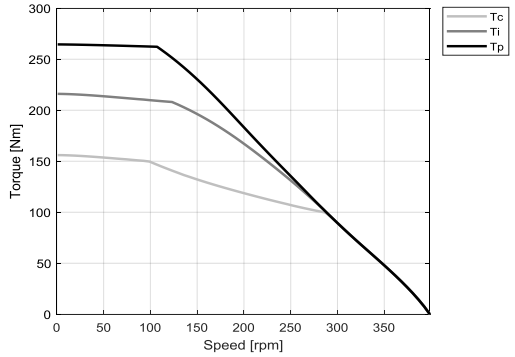


TA - WATER COOLING



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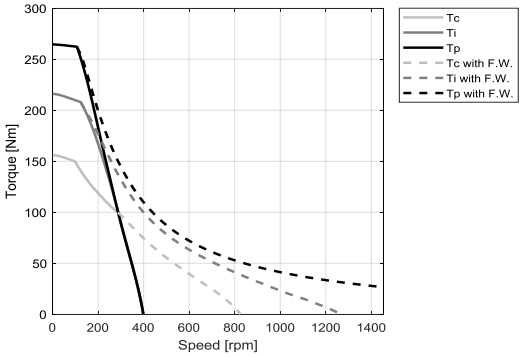
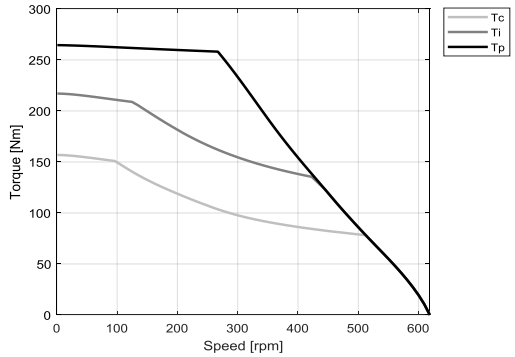


SB - WATER COOLING



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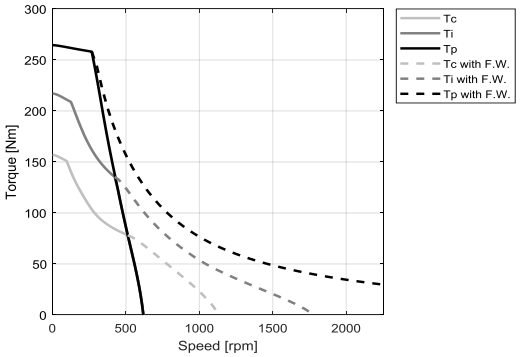
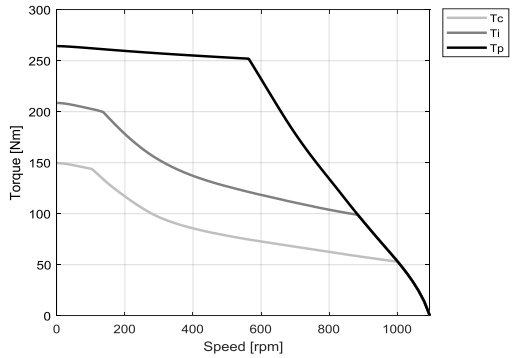


UB - WATER COOLING



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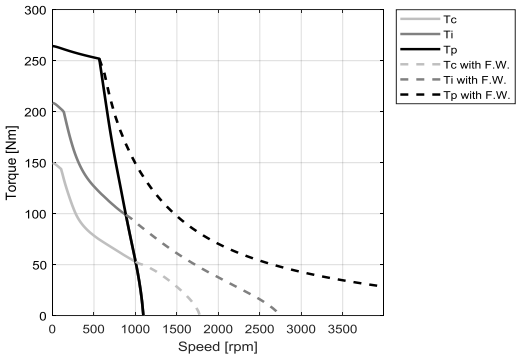

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TMB Standard

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MOTOR PERFORMANCE		Winding codes	RA	RB	TB	VB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	67.7	67.7	67.8	67.8
Ti	Intermittent torque	Nm	46.3	46.3	46.7	47.7
Tc	Continuous torque	Nm	33.0	33.0	33.3	34.2
Ts	Standstill torque	Nm	26.1	26.1	26.4	27.1
Ip	Peak current	Arms	15.1	30.2	46.1	70.4
Ii	Intermittent current	Arms	8.23	16.5	25.4	40.2
Ic	Continuous current	Arms	5.20	10.4	16.1	25.4
Is	Standstill current	Arms	3.94	7.88	12.2	19.2
ns	Rated low speed	rpm	0.60	0.60	0.58	0.59
nm	Maximum speed without flux weakening	rpm	923	1850	2830	3370
nm,FW	Maximum speed with flux weakening	rpm	2140	3080	3370	3370
τon,p	Maximum ON time for peak cycle	s	6.6	6.6	7.1	7.6
τon,i	Maximum ON time for intermittent cycle	s	3.0	3.0	3.0	3.0
Pp	Power dissipation @ Ip	W	4710	4710	4530	4430
Pi	Power dissipation @ Ii	W	1740	1740	1720	1810
Pc	Power dissipation @ Ic	W	694	694	687	723
Td	Max. detent torque (average to peak)	Nm	0.50	0.50	0.50	0.50

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	7.47	3.73	2.44	1.60
Ku	Back EMF constant (*)	Vrms/(rad/s)	4.30	2.15	1.41	0.922
Km	Motor constant	Nm/√W	1.76	1.76	1.79	1.80
R20	Electrical resistance at 20°C (*)	Ohm	12.0	3.00	1.24	0.525
Ld/Lq	Electrical inductance (*)	mH	90.3 / 84.4	22.6 / 21.1	9.67 / 9.01	4.14 / 3.83
Isc	Maximum short-circuit current	Arms	5.00	10.0	15.3	23.4
nb	Base speed	rpm	720	1640	2760	N/A
nb,i	Base speed at intermittent duty cycle	rpm	561	1380	2290	N/A
nb,p	Base speed at peak duty cycle	rpm	363	873	1400	2200
nn	Rated speed	rpm	629	1510	2010	2020
Tn	Rated torque	Nm	24.0	16.0	13.1	13.1
In	Rated current	Arms	3.80	5.07	6.51	9.93
τth	Thermal time constant	s	90.8	90.8	93.8	92.4
Rth	Thermal resistance	K/W	0.153	0.153	0.155	0.147
2p	Number of poles	-	22	22	22	22
J	Rotor inertia	kg·m²	0.00273	0.00273	0.00273	0.00273
mr	Rotor mass	kg	1.00	1.00	1.00	1.00
ms	Stator mass	kg	7.68	7.68	7.74	7.77

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.026	0.026	0.026	0.026
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	2.2	2.2	2.1	2.3
Δpw	Max. pressure drop at qw	bar	0.1	0.1	0.1	0.1

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
Please refer to ETEL Integration Manual for the mass of the optional cooling jacket and the possible additional pressure drop.

Caution: Any use of the motor beyond speed/torque limit could lead to hazardous voltage and serious injuries. Customer is responsible for setting safeties/limitations that will keep the motor in its safe operating area. ETEL cannot be held responsible if the motor is used in an improper way.

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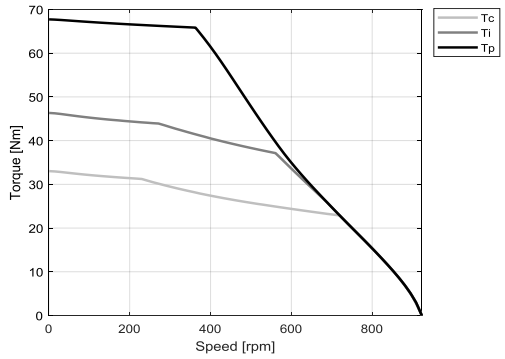
CONVENTIONAL TORQUE MOTOR TMB+0175-030

RA - WATER COOLING



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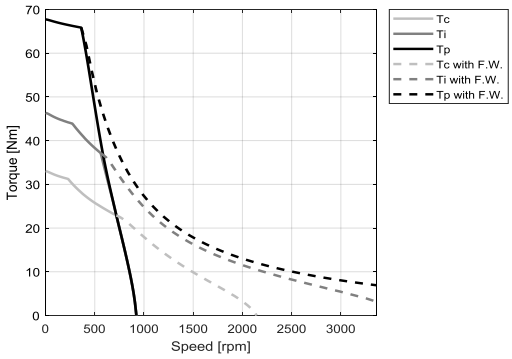

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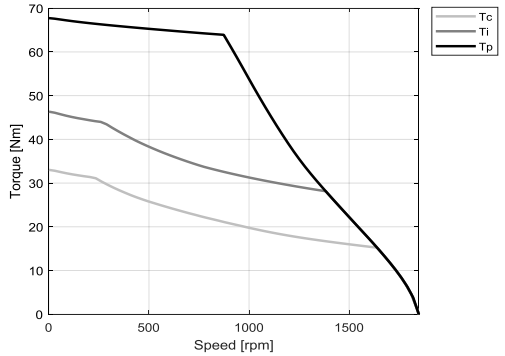

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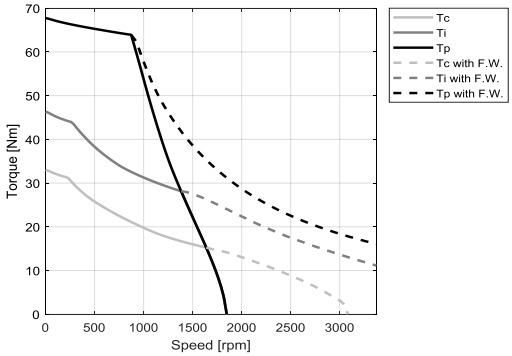

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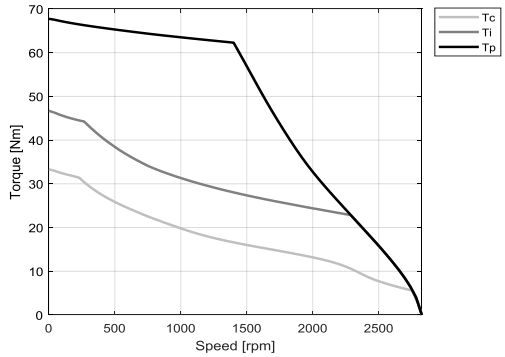

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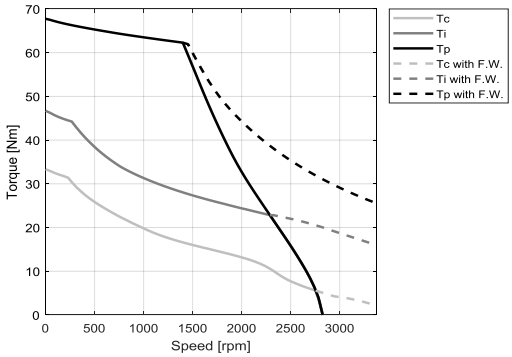

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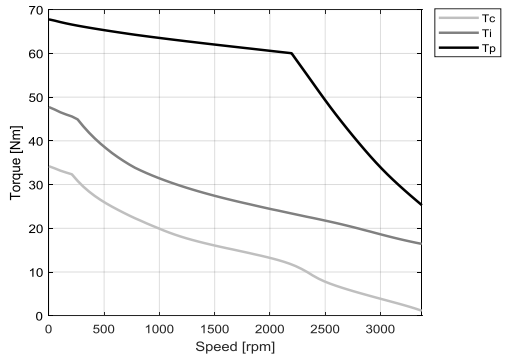

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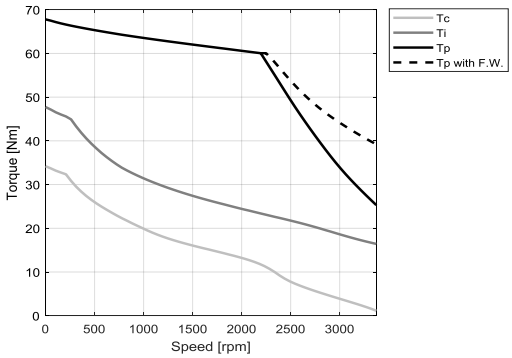

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0175-050

MOTOR PERFORMANCE		Winding codes	RA	RB	TB	VB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	118	118	118	118
Ti	Intermittent torque	Nm	84.9	84.9	85.7	87.7
Tc	Continuous torque	Nm	60.0	60.0	60.7	62.4
Ts	Standstill torque	Nm	47.1	47.1	47.7	49.2
Ip	Peak current	Arms	14.3	28.5	43.6	66.6
Ii	Intermittent current	Arms	8.76	17.5	27.1	42.9
Ic	Continuous current	Arms	5.54	11.1	17.2	27.1
Is	Standstill current	Arms	4.20	8.39	13.0	20.6
ns	Rated low speed	rpm	0.68	0.68	0.66	0.67
nm	Maximum speed without flux weakening	rpm	554	1110	1690	2590
nm,FW	Maximum speed with flux weakening	rpm	1250	2050	2480	2770
τon,p	Maximum ON time for peak cycle	s	8.0	8.0	8.7	9.2
τon,i	Maximum ON time for intermittent cycle	s	3.0	3.0	3.0	2.9
Pp	Power dissipation @ Ip	W	5640	5640	5410	5280
Pi	Power dissipation @ Ii	W	2710	2710	2680	2820
Pc	Power dissipation @ Ic	W	1080	1080	1070	1130
Td	Max. detent torque (average to peak)	Nm	0.84	0.84	0.84	0.84

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	12.5	6.24	4.08	2.67
Ku	Back EMF constant (*)	Vrms/(rad/s)	7.17	3.59	2.35	1.54
Km	Motor constant	Nm/√W	2.50	2.50	2.55	2.58
R20	Electrical resistance at 20°C (*)	Ohm	16.6	4.14	1.71	0.718
Ld/Lq	Electrical inductance (*)	mH	139 / 129	34.8 / 32.1	14.9 / 13.7	6.38 / 5.82
Isc	Maximum short-circuit current	Arms	5.41	10.8	16.5	25.3
nb	Base speed	rpm	419	977	1570	2570
nb,i	Base speed at intermittent duty cycle	rpm	314	834	1370	2260
nb,p	Base speed at peak duty cycle	rpm	196	532	874	1390
nn	Rated speed	rpm	362	897	1460	1530
Tn	Rated torque	Nm	43.3	28.7	22.2	21.4
In	Rated current	Arms	4.00	5.31	6.48	9.59
τth	Thermal time constant	s	79.7	79.7	82.1	81.0
Rth	Thermal resistance	K/W	0.0969	0.0969	0.0980	0.0929
2p	Number of poles	-	22	22	22	22
J	Rotor inertia	kg·m²	0.00458	0.00458	0.00458	0.00458
mr	Rotor mass	kg	1.69	1.69	1.69	1.69
ms	Stator mass	kg	10.1	10.1	10.2	10.2

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.037	0.037	0.037	0.037
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	3.4	3.4	3.3	3.5
Δpw	Max. pressure drop at qw	bar	0.1	0.1	0.1	0.1

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
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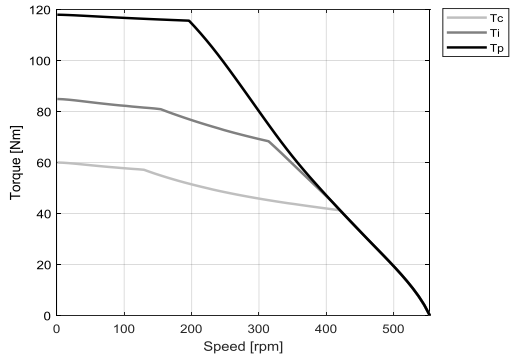
CONVENTIONAL TORQUE MOTOR TMB+0175-050

RA - WATER COOLING



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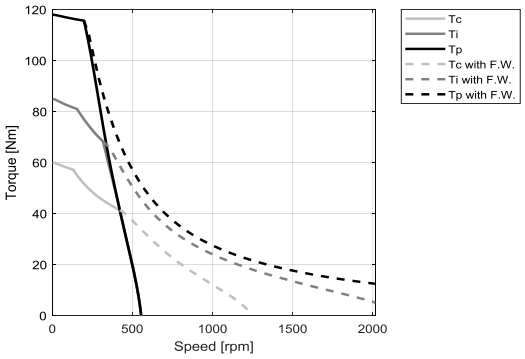

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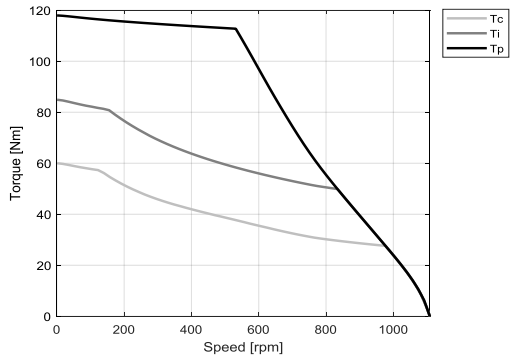

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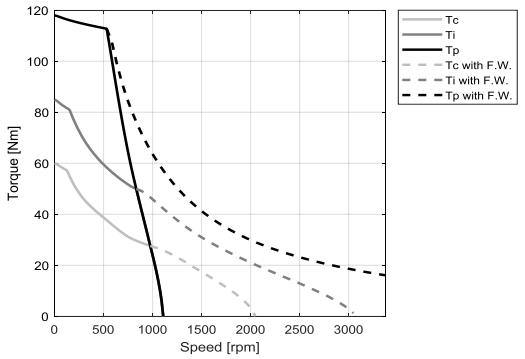

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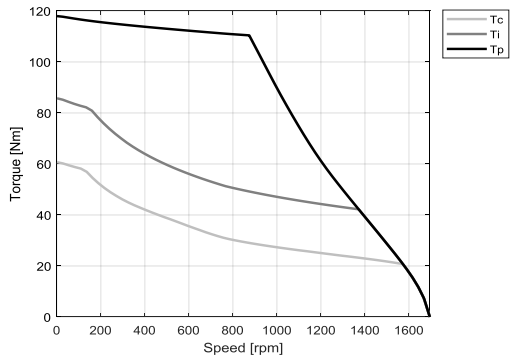

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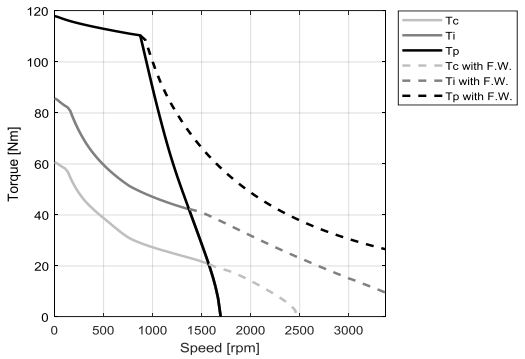

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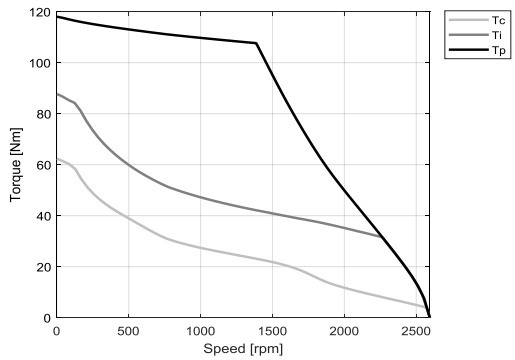

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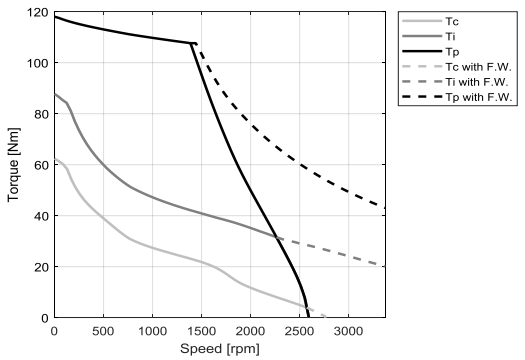

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0175-070

MOTOR PERFORMANCE		Winding codes	RA	RB	TB	VB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	165	165	165	165
Ti	Intermittent torque	Nm	122	122	124	127
Tc	Continuous torque	Nm	86.6	86.6	87.7	90.1
Ts	Standstill torque	Nm	68.0	68.0	68.9	71.0
Ip	Peak current	Arms	13.8	27.7	42.3	64.6
Ii	Intermittent current	Arms	8.97	17.9	27.8	44.0
Ic	Continuous current	Arms	5.67	11.3	17.6	27.8
Is	Standstill current	Arms	4.30	8.59	13.3	21.1
ns	Rated low speed	rpm	0.71	0.71	0.69	0.70
nm	Maximum speed without flux weakening	rpm	395	792	1210	1850
nm,FW	Maximum speed with flux weakening	rpm	839	1430	1810	2080
τon,p	Maximum ON time for peak cycle	s	8.6	8.6	9.4	10
τon,i	Maximum ON time for intermittent cycle	s	3.0	3.0	2.9	2.9
Pp	Power dissipation @ Ip	W	6720	6720	6420	6270
Pi	Power dissipation @ Ii	W	3610	3610	3580	3760
Pc	Power dissipation @ Ic	W	1450	1450	1430	1500
Td	Max. detent torque (average to peak)	Nm	1.2	1.2	1.2	1.2

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	17.5	8.75	5.73	3.75
Ku	Back EMF constant (*)	Vrms/(rad/s)	10.0	5.02	3.29	2.15
Km	Motor constant	Nm/√W	3.10	3.10	3.17	3.20
R20	Electrical resistance at 20°C (*)	Ohm	21.2	5.29	2.17	0.915
Ld/Lq	Electrical inductance (*)	mH	183 / 169	45.8 / 42.3	19.7 / 18.1	8.42 / 7.66
Isc	Maximum short-circuit current	Arms	5.75	11.5	17.6	26.8
nb	Base speed	rpm	288	696	1120	1830
nb,i	Base speed at intermittent duty cycle	rpm	200	594	990	1620
nb,p	Base speed at peak duty cycle	rpm	114	375	636	1020
nn	Rated speed	rpm	246	638	1050	1120
Tn	Rated torque	Nm	63.2	41.0	31.7	30.1
In	Rated current	Arms	4.13	5.36	6.49	9.45
τth	Thermal time constant	s	76.5	76.5	78.6	77.7
Rth	Thermal resistance	K/W	0.0716	0.0716	0.0725	0.0687
2p	Number of poles	-	22	22	22	22
J	Rotor inertia	kg·m²	0.00644	0.00644	0.00644	0.00644
mr	Rotor mass	kg	2.37	2.37	2.37	2.37
ms	Stator mass	kg	12.8	12.8	12.9	12.9

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.049	0.049	0.049	0.049
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	4.5	4.5	4.5	4.7
Δpw	Max. pressure drop at qw	bar	0.1	0.1	0.1	0.1

Notes: (*) terminal to terminal.
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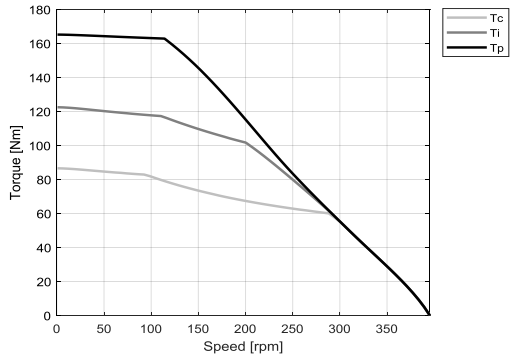
CONVENTIONAL TORQUE MOTOR TMB+0175-070

RA - WATER COOLING



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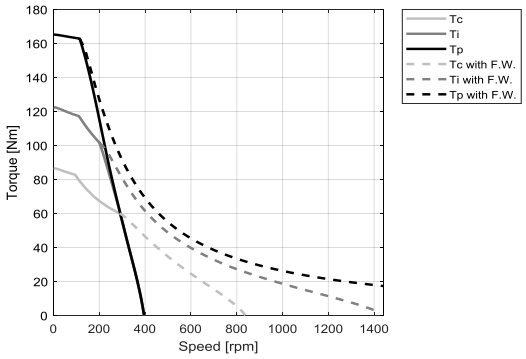

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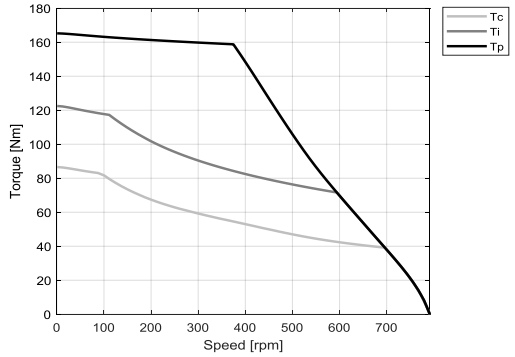

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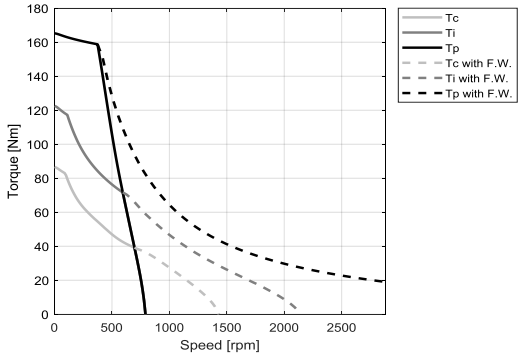

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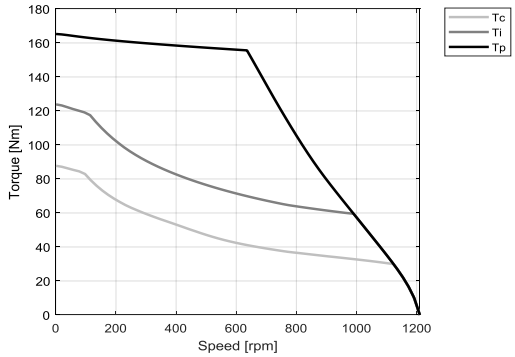

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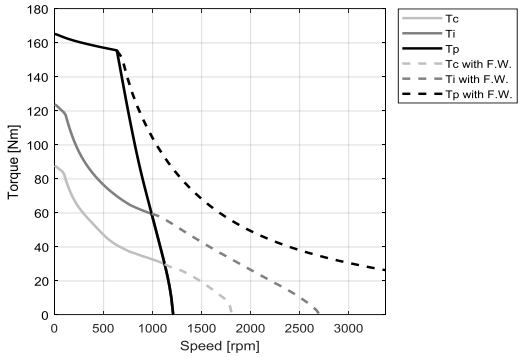

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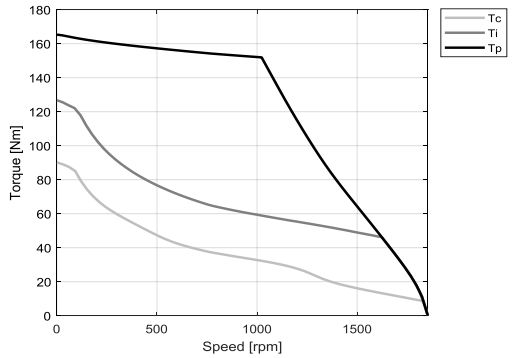

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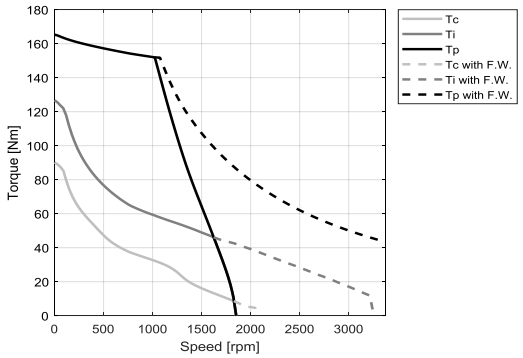

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0175-100

MOTOR PERFORMANCE		Winding codes	RA	RB	TB	VB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	236	236	236	236
Ti	Intermittent torque	Nm	180	180	182	186
Tc	Continuous torque	Nm	127	127	129	132
Ts	Standstill torque	Nm	99.6	99.6	101	104
Ip	Peak current	Arms	13.5	27.0	41.3	63.1
Ii	Intermittent current	Arms	9.15	18.3	28.5	45.0
Ic	Continuous current	Arms	5.79	11.6	18.0	28.5
Is	Standstill current	Arms	4.39	8.77	13.6	21.6
ns	Rated low speed	rpm	0.76	0.76	0.74	0.75
nm	Maximum speed without flux weakening	rpm	277	554	846	1290
nm,FW	Maximum speed with flux weakening	rpm	593	1030	1450	1960
τon,p	Maximum ON time for peak cycle	s	8.9	8.9	9.7	10
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	8450	8450	8060	7860
Pi	Power dissipation @ Ii	W	4990	4990	4940	5190
Pc	Power dissipation @ Ic	W	2000	2000	1980	2080
Td	Max. detent torque (average to peak)	Nm	1.7	1.7	1.7	1.7

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	25.0	12.5	8.19	5.36
Ku	Back EMF constant (*)	Vrms/(rad/s)	14.3	7.17	4.70	3.07
Km	Motor constant	Nm/√W	3.84	3.84	3.93	3.97
R20	Electrical resistance at 20°C (*)	Ohm	28.2	7.05	2.89	1.21
Ld/Lq	Electrical inductance (*)	mH	248 / 228	61.9 / 57.0	26.5 / 24.3	11.4 / 10.3
Isc	Maximum short-circuit current	Arms	6.08	12.2	18.6	28.4
nb	Base speed	rpm	176	469	766	1210
nb,i	Base speed at intermittent duty cycle	rpm	68.4	393	677	1100
nb,p	Base speed at peak duty cycle	rpm	38.6	244	441	727
nn	Rated speed	rpm	142	422	710	1140
Tn	Rated torque	Nm	103	69.2	53.9	43.8
In	Rated current	Arms	4.74	6.23	7.52	9.55
τth	Thermal time constant	s	71.7	71.7	73.5	72.7
Rth	Thermal resistance	K/W	0.0508	0.0508	0.0513	0.0487
2p	Number of poles	-	22	22	22	22
J	Rotor inertia	kg·m²	0.00912	0.00912	0.00912	0.00912
mr	Rotor mass	kg	3.35	3.35	3.35	3.35
ms	Stator mass	kg	16.3	16.3	16.4	16.5

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.066	0.066	0.066	0.066
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	6.2	6.2	6.2	6.5
Δpw	Max. pressure drop at qw	bar	0.3	0.3	0.3	0.3

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
Please refer to ETEL Integration Manual for the mass of the optional cooling jacket and the possible additional pressure drop.

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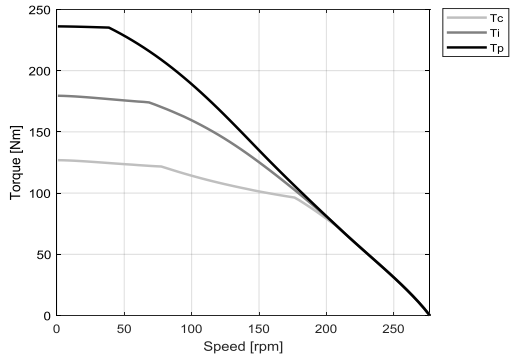
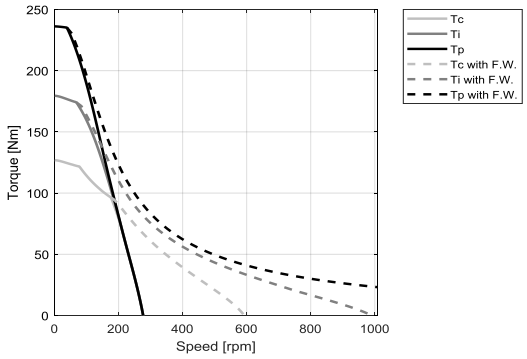
CONVENTIONAL TORQUE MOTOR TMB+0175-100

RA - WATER COOLING



RA - WATER COOLING



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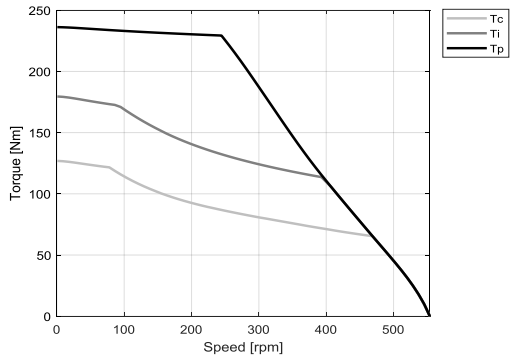

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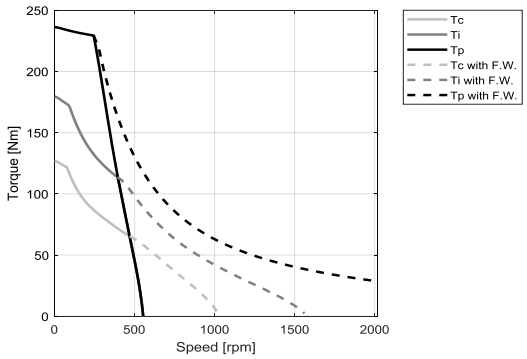
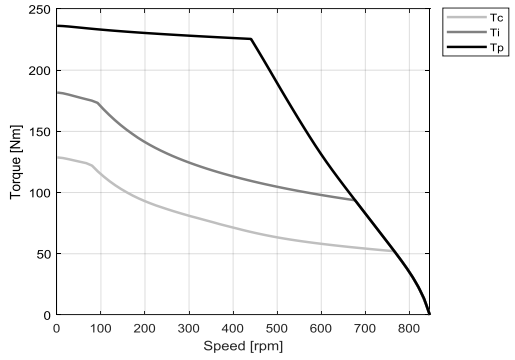


TB - WATER COOLING



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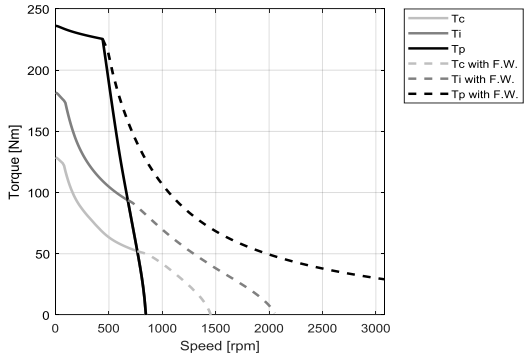
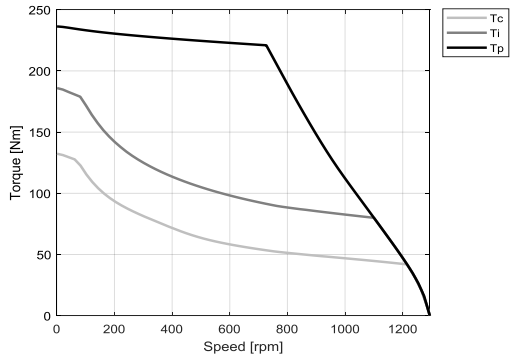


VB - WATER COOLING



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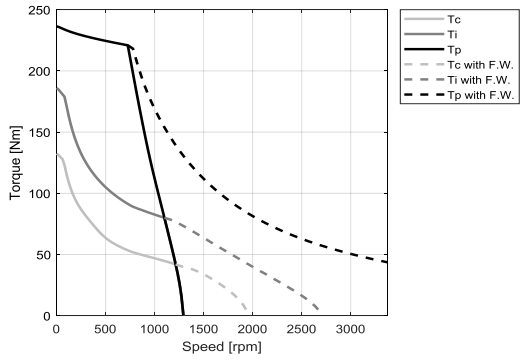

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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+0175-150

MOTOR PERFORMANCE		Winding codes	RA	RB	TB	VB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	319	354	354	354
Ti	Intermittent torque	Nm	265	271	274	281
Tc	Continuous torque	Nm	191	191	194	199
Ts	Standstill torque	Nm	149	149	152	157
Ip	Peak current	Arms	11.2	26.5	40.5	61.9
Ii	Intermittent current	Arms	8.78	18.2	28.4	44.9
Ic	Continuous current	Arms	5.76	11.5	17.9	28.4
Is	Standstill current	Arms	4.36	8.73	13.6	21.5
ns	Rated low speed	rpm	0.77	0.77	0.75	0.76
nm	Maximum speed without flux weakening	rpm	184	369	564	862
nm,FW	Maximum speed with flux weakening	rpm	421	711	1010	1430
τon,p	Maximum ON time for peak cycle	s	14	8.3	9.1	9.7
τon,i	Maximum ON time for intermittent cycle	s	6.4	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	8010	11600	11000	10700
Pi	Power dissipation @ Ii	W	6300	6960	6900	7240
Pc	Power dissipation @ Ic	W	2780	2780	2760	2890
Td	Max. detent torque (average to peak)	Nm	2.5	2.5	2.5	2.5

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	37.5	18.8	12.3	8.05
Ku	Back EMF constant (*)	Vrms/(rad/s)	21.5	10.8	7.04	4.61
Km	Motor constant	Nm/√W	4.83	4.83	4.95	5.00
R20	Electrical resistance at 20°C (*)	Ohm	40.3	10.1	4.11	1.73
Ld/Lq	Electrical inductance (*)	mH	367 / 339	91.8 / 84.7	39.4 / 36.1	16.9 / 15.3
Isc	Maximum short-circuit current	Arms	6.15	12.3	18.8	28.7
nb	Base speed	rpm	60.5	288	490	790
nb,i	Base speed at intermittent duty cycle	rpm	0.00	220	420	707
nb,p	Base speed at peak duty cycle	rpm	0.00	127	267	464
nn	Rated speed	rpm	42.9	250	447	736
Tn	Rated torque	Nm	186	124	95.2	76.2
In	Rated current	Arms	5.74	7.44	8.72	10.8
τth	Thermal time constant	s	71.0	71.0	72.7	72.1
Rth	Thermal resistance	K/W	0.0348	0.0348	0.0352	0.0334
2p	Number of poles	-	22	22	22	22
J	Rotor inertia	kg·m²	0.0138	0.0138	0.0138	0.0138
mr	Rotor mass	kg	5.06	5.06	5.06	5.06
ms	Stator mass	kg	23.1	23.1	23.3	23.3

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.094	0.094	0.094	0.094
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	8.7	8.7	8.6	9.0
Δpw	Max. pressure drop at qw	bar	0.5	0.5	0.5	0.5

Notes: (*) terminal to terminal.
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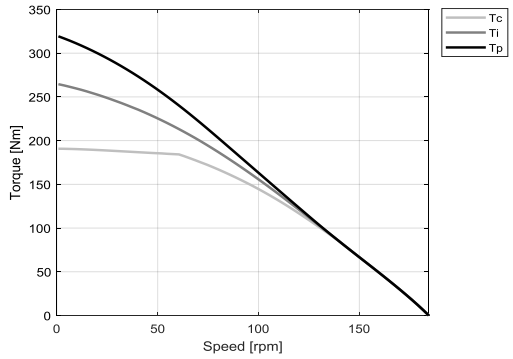
CONVENTIONAL TORQUE MOTOR TMB+0175-150

RA - WATER COOLING



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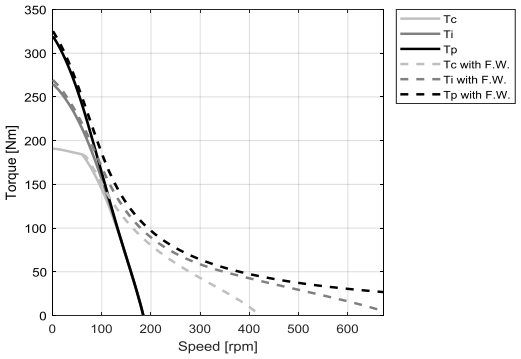

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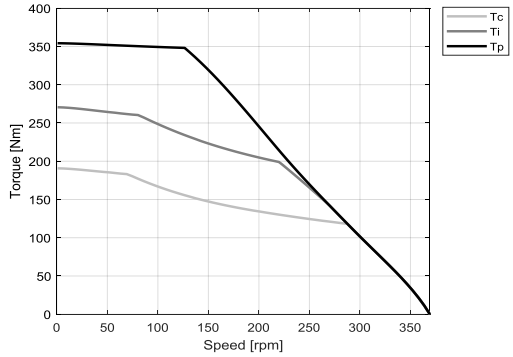

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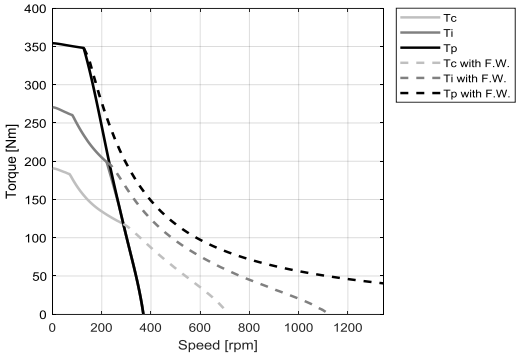
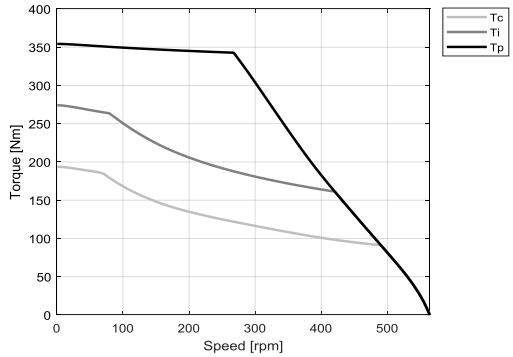


TB - WATER COOLING



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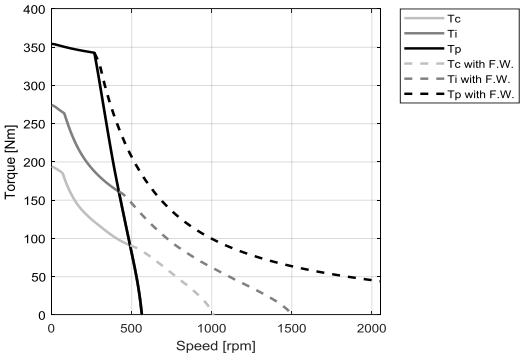

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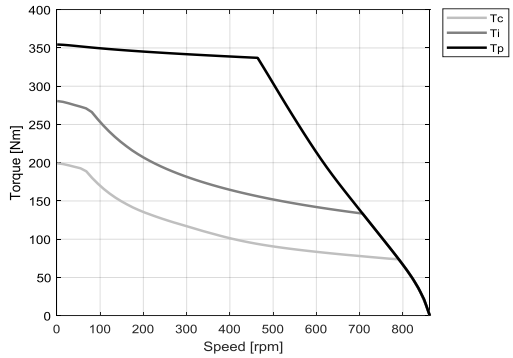

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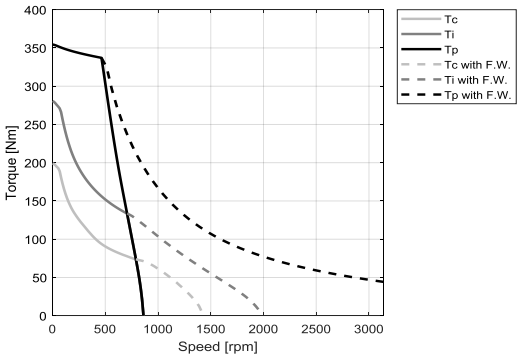

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0175-200

MOTOR PERFORMANCE		Winding codes	TA	RB	TB	VB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	472	472	472	473
Ti	Intermittent torque	Nm	364	358	364	372
Tc	Continuous torque	Nm	256	252	256	263
Ts	Standstill torque	Nm	201	197	201	207
Ip	Peak current	Arms	20.1	26.3	40.1	61.3
Ii	Intermittent current	Arms	14.0	17.9	28.0	44.2
Ic	Continuous current	Arms	8.84	11.3	17.7	28.0
Is	Standstill current	Arms	6.70	8.59	13.4	21.2
ns	Rated low speed	rpm	0.76	0.78	0.76	0.77
nm	Maximum speed without flux weakening	rpm	211	277	423	647
nm,FW	Maximum speed with flux weakening	rpm	451	551	774	1110
τon,p	Maximum ON time for peak cycle	s	7.8	7.1	7.8	8.3
τon,i	Maximum ON time for intermittent cycle	s	2.8	2.8	2.8	2.8
Pp	Power dissipation @ Ip	W	14100	14800	14100	13700
Pi	Power dissipation @ Ii	W	8630	8680	8630	9030
Pc	Power dissipation @ Ic	W	3450	3470	3450	3610
Td	Max. detent torque (average to peak)	Nm	3.4	3.4	3.4	3.4

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	32.8	25.0	16.4	10.7
Ku	Back EMF constant (*)	Vrms/(rad/s)	18.8	14.3	9.39	6.15
Km	Motor constant	Nm/√W	5.77	5.63	5.77	5.83
R20	Electrical resistance at 20°C (*)	Ohm	21.5	13.2	5.38	2.26
Ld/Lq	Electrical inductance (*)	mH	209 / 192	122 / 113	52.2 / 48.1	22.4 / 20.4
Isc	Maximum short-circuit current	Arms	9.44	12.4	18.9	28.8
nb	Base speed	rpm	120	195	351	579
nb,i	Base speed at intermittent duty cycle	rpm	32.5	116	289	508
nb,p	Base speed at peak duty cycle	rpm	6.78	59.3	176	329
nn	Rated speed	rpm	87.6	163	314	535
Tn	Rated torque	Nm	228	186	145	113
In	Rated current	Arms	8.01	8.35	9.91	11.9
τth	Thermal time constant	s	71.3	69.8	71.3	70.8
Rth	Thermal resistance	K/W	0.0265	0.0262	0.0265	0.0251
2p	Number of poles	-	22	22	22	22
J	Rotor inertia	kg·m²	0.0185	0.0185	0.0185	0.0185
mr	Rotor mass	kg	6.79	6.79	6.79	6.79
ms	Stator mass	kg	29.7	29.6	29.7	29.8

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.120	0.120	0.120	0.120
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	11	11	11	11
Δpw	Max. pressure drop at qw	bar	1.0	1.0	1.0	1.0

Notes: (*) terminal to terminal.
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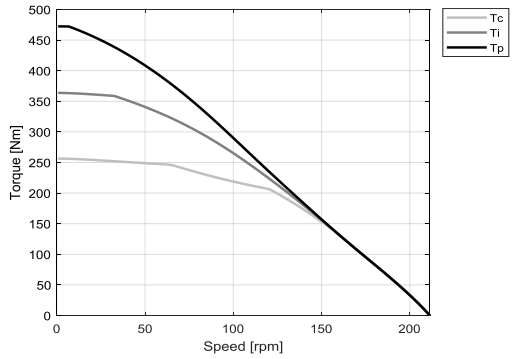
TA - WATER COOLING



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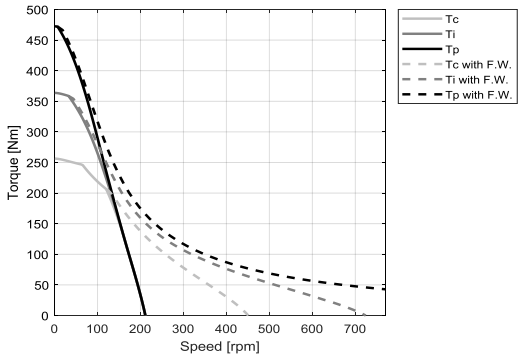
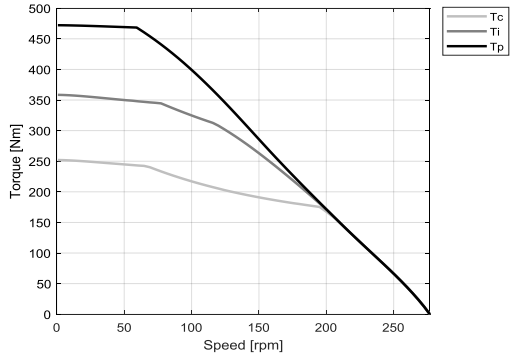


RB - WATER COOLING



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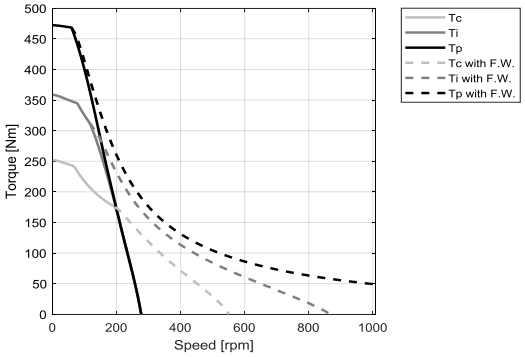

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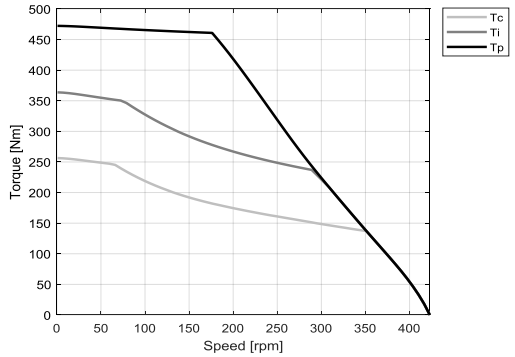

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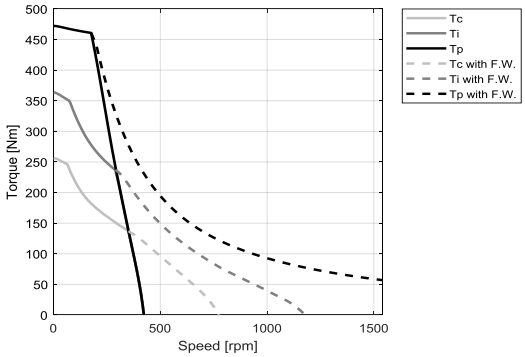

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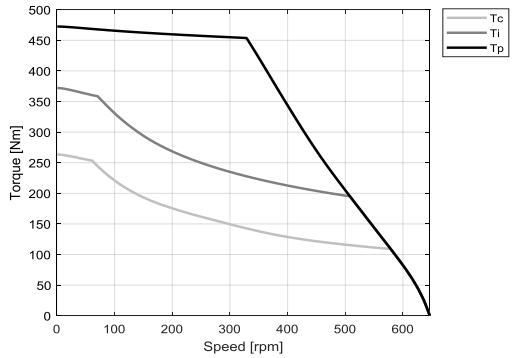

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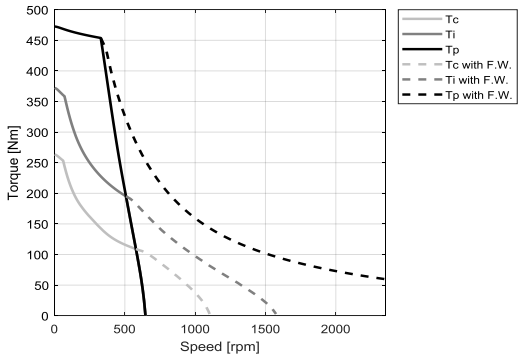

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0210-030

MOTOR PERFORMANCE		Winding codes	RA	TA	TB	UB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	128	128	128	128
Ti	Intermittent torque	Nm	94.6	98.1	98.1	94.0
Tc	Continuous torque	Nm	66.2	69.1	69.1	65.7
Ts	Standstill torque	Nm	51.5	54.0	54.0	51.0
Ip	Peak current	Arms	17.3	25.0	50.1	69.1
Ii	Intermittent current	Arms	11.3	17.2	34.3	44.6
Ic	Continuous current	Arms	7.12	10.9	21.7	28.2
Is	Standstill current	Arms	5.40	8.23	16.5	21.4
ns	Rated low speed	rpm	0.53	0.51	0.51	0.53
nm	Maximum speed without flux weakening	rpm	678	983	1970	2330
nm,FW	Maximum speed with flux weakening	rpm	1690	2060	2330	2330
τon,p	Maximum ON time for peak cycle	s	5.9	7.0	7.0	5.7
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	2.9	2.8
Pp	Power dissipation @ Ip	W	4970	4550	4550	5060
Pi	Power dissipation @ Ii	W	2720	2790	2790	2720
Pc	Power dissipation @ Ic	W	1090	1110	1110	1090
Td	Max. detent torque (average to peak)	Nm	0.58	0.58	0.58	0.58

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	10.2	7.05	3.52	2.55
Ku	Back EMF constant (*)	Vrms/(rad/s)	5.85	4.04	2.02	1.46
Km	Motor constant	Nm/√W	2.63	2.73	2.73	2.61
R20	Electrical resistance at 20°C (*)	Ohm	10.0	4.43	1.11	0.639
Ld/Lq	Electrical inductance (*)	mH	39.7 / 35.9	18.9 / 16.9	4.73 / 4.24	2.48 / 2.25
Isc	Maximum short-circuit current	Arms	7.74	11.2	22.4	31.0
nb	Base speed	rpm	519	817	1850	N/A
nb,i	Base speed at intermittent duty cycle	rpm	369	644	1560	N/A
nb,p	Base speed at peak duty cycle	rpm	304	504	1100	1540
nn	Rated speed	rpm	447	734	1380	1370
Tn	Rated torque	Nm	55.0	46.0	32.7	32.4
In	Rated current	Arms	6.18	7.53	11.2	15.3
τth	Thermal time constant	s	51.5	53.6	53.6	51.9
Rth	Thermal resistance	K/W	0.0971	0.0948	0.0948	0.0972
2p	Number of poles	-	44	44	44	44
J	Rotor inertia	kg·m²	0.00908	0.00908	0.00908	0.00908
mr	Rotor mass	kg	1.52	1.52	1.52	1.52
ms	Stator mass	kg	6.45	6.54	6.54	6.49

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.038	0.038	0.038	0.038
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	3.4	3.5	3.5	3.4
Δpw	Max. pressure drop at qw	bar	0.1	0.1	0.1	0.1

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
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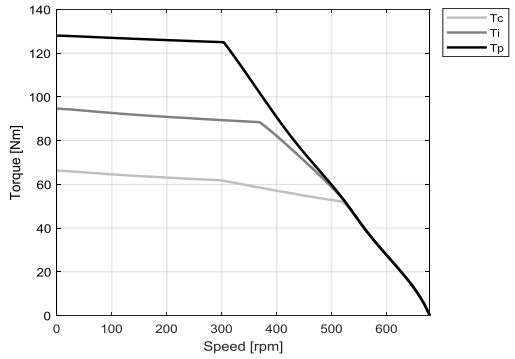
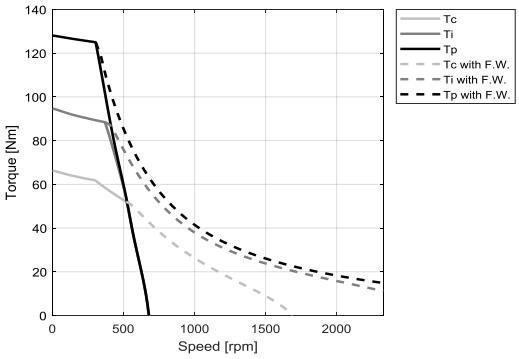
CONVENTIONAL TORQUE MOTOR TMB+0210-030

RA - WATER COOLING



RA - WATER COOLING



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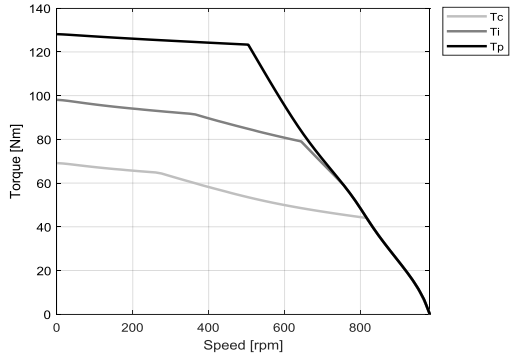

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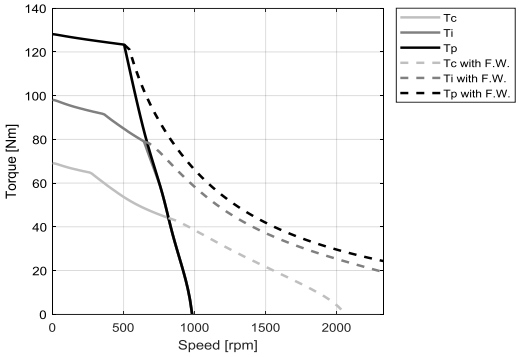
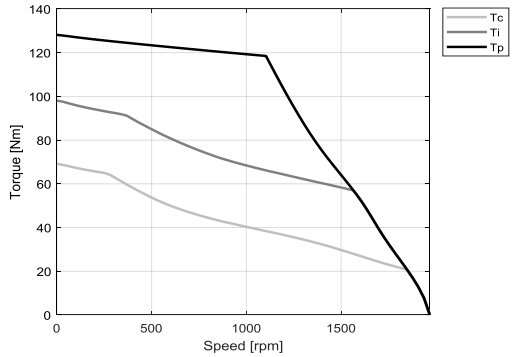


TB - WATER COOLING



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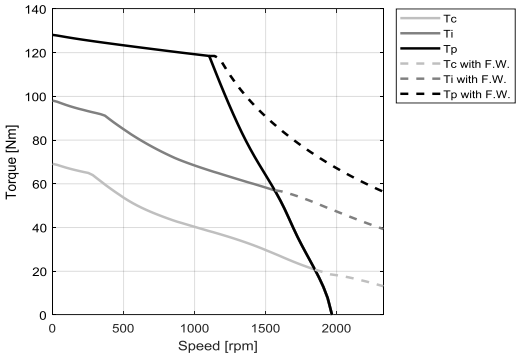
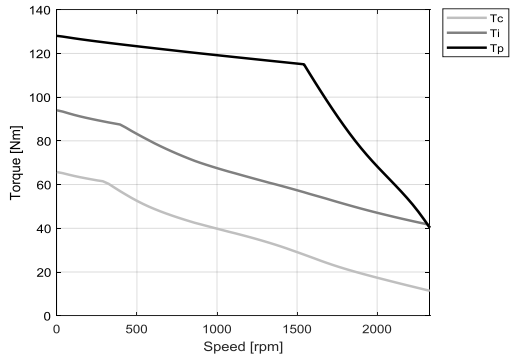


UB - WATER COOLING



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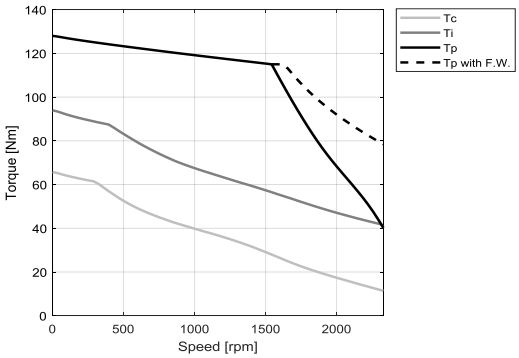

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0210-050

MOTOR PERFORMANCE		Winding codes	RA	TA	TB	UB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	223	223	223	223
Ti	Intermittent torque	Nm	175	182	182	174
Tc	Continuous torque	Nm	122	128	128	122
Ts	Standstill torque	Nm	94.9	99.8	99.8	94.6
Ip	Peak current	Arms	16.5	23.9	47.8	66.0
Ii	Intermittent current	Arms	12.0	18.3	36.7	47.8
Ic	Continuous current	Arms	7.58	11.6	23.2	30.2
Is	Standstill current	Arms	5.74	8.78	17.6	22.9
ns	Rated low speed	rpm	0.59	0.57	0.57	0.59
nm	Maximum speed without flux weakening	rpm	387	560	1120	1550
nm,FW	Maximum speed with flux weakening	rpm	927	1210	1830	2190
τon,p	Maximum ON time for peak cycle	s	6.8	8.3	8.3	6.7
τon,i	Maximum ON time for intermittent cycle	s	2.8	2.8	2.8	2.8
Pp	Power dissipation @ Ip	W	6460	5870	5870	6500
Pi	Power dissipation @ Ii	W	4450	4550	4550	4440
Pc	Power dissipation @ Ic	W	1780	1820	1820	1780
Td	Max. detent torque (average to peak)	Nm	1.0	1.0	1.0	1.0

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	17.8	12.3	6.14	4.44
Ku	Back EMF constant (*)	Vrms/(rad/s)	10.3	7.08	3.54	2.56
Km	Motor constant	Nm/√W	3.80	3.97	3.97	3.79
R20	Electrical resistance at 20°C (*)	Ohm	14.6	6.37	1.59	0.917
Ld/Lq	Electrical inductance (*)	mH	64.7 / 57.9	30.8 / 27.3	7.71 / 6.82	4.04 / 3.62
Isc	Maximum short-circuit current	Arms	8.33	12.1	24.1	33.3
nb	Base speed	rpm	269	454	1010	1470
nb,i	Base speed at intermittent duty cycle	rpm	169	344	884	1290
nb,p	Base speed at peak duty cycle	rpm	149	278	645	912
nn	Rated speed	rpm	224	403	930	1040
Tn	Rated torque	Nm	106	87.2	59.2	52.9
In	Rated current	Arms	6.82	8.05	11.3	14.1
τth	Thermal time constant	s	45.9	47.6	47.6	46.1
Rth	Thermal resistance	K/W	0.0584	0.0571	0.0571	0.0584
2p	Number of poles	-	44	44	44	44
J	Rotor inertia	kg·m²	0.0152	0.0152	0.0152	0.0152
mr	Rotor mass	kg	2.56	2.56	2.56	2.56
ms	Stator mass	kg	8.68	8.81	8.81	8.73

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.056	0.056	0.056	0.056
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	5.6	5.7	5.7	5.5
Δpw	Max. pressure drop at qw	bar	0.2	0.2	0.2	0.2

Notes: (*) terminal to terminal.
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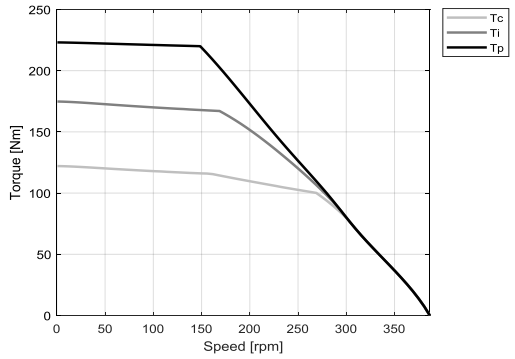
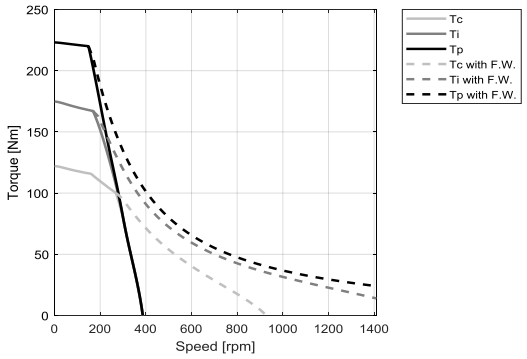
CONVENTIONAL TORQUE MOTOR TMB+0210-050

RA - WATER COOLING



RA - WATER COOLING



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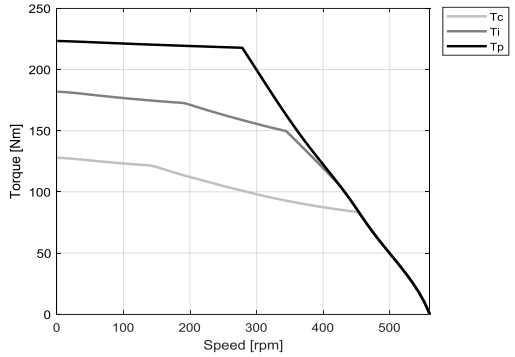

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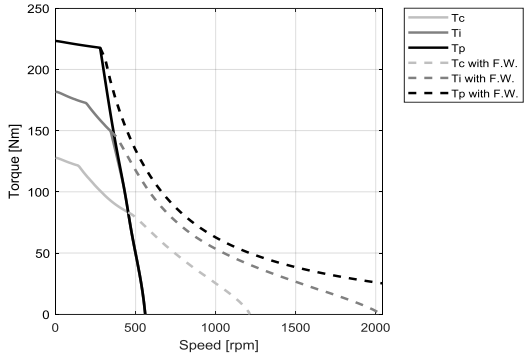
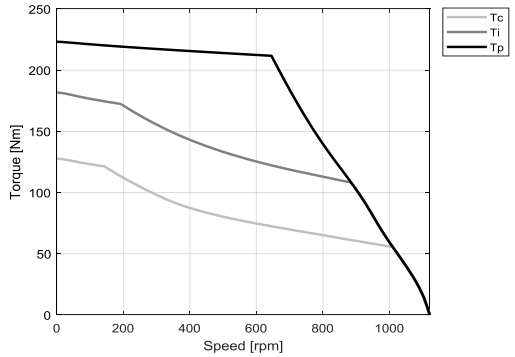


TB - WATER COOLING



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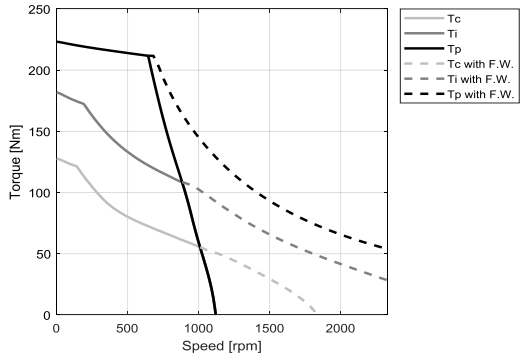
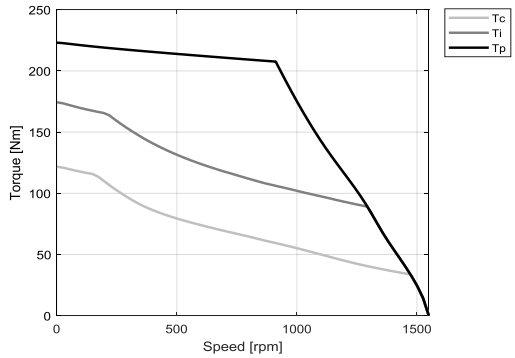
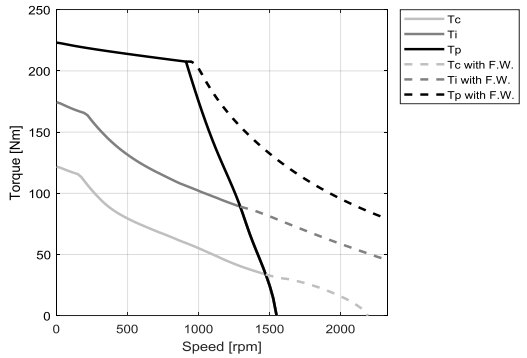


UB - WATER COOLING



UB - WATER COOLING



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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0210-070

MOTOR PERFORMANCE		Winding codes / UNIT	RA WATER COOLING	TA WATER COOLING	TB WATER COOLING	UB WATER COOLING
Tp	Peak torque	Nm	318	318	318	318
Ti	Intermittent torque	Nm	252	263	263	252
Tc	Continuous torque	Nm	176	185	185	176
Ts	Standstill torque	Nm	137	145	145	137
Ip	Peak current	Arms	16.4	23.8	47.6	65.7
Ii	Intermittent current	Arms	12.2	18.7	37.3	48.7
Ic	Continuous current	Arms	7.70	11.8	23.6	30.8
Is	Standstill current	Arms	5.83	8.94	17.9	23.3
ns	Rated low speed	rpm	0.60	0.58	0.58	0.60
nm	Maximum speed without flux weakening	rpm	273	396	793	1100
nm,FW	Maximum speed with flux weakening	rpm	626	820	1290	1590
τon,p	Maximum ON time for peak cycle	s	6.8	8.3	8.3	6.7
τon,i	Maximum ON time for intermittent cycle	s	2.8	2.8	2.8	2.7
Pp	Power dissipation @ Ip	W	8370	7580	7580	8370
Pi	Power dissipation @ Ii	W	6020	6150	6150	6000
Pc	Power dissipation @ Ic	W	2410	2460	2460	2400
Td	Max. detent torque (average to peak)	Nm	1.4	1.4	1.4	1.4

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	25.3	17.5	8.75	6.34
Ku	Back EMF constant (*)	Vrms/(rad/s)	14.5	10.0	5.01	3.63
Km	Motor constant	Nm/√W	4.72	4.95	4.95	4.73
R20	Electrical resistance at 20°C (*)	Ohm	19.2	8.34	2.09	1.20
Ld/Lq	Electrical inductance (*)	mH	87.4 / 78.2	41.7 / 36.8	10.4 / 9.21	5.46 / 4.89
Isc	Maximum short-circuit current	Arms	8.71	12.6	25.2	34.9
nb	Base speed	rpm	167	313	710	1040
nb,i	Base speed at intermittent duty cycle	rpm	84.6	222	621	918
nb,p	Base speed at peak duty cycle	rpm	75.3	179	450	644
nn	Rated speed	rpm	129	273	651	731
Tn	Rated torque	Nm	163	129	88.1	79.1
In	Rated current	Arms	7.39	8.27	11.6	14.5
τth	Thermal time constant	s	45.2	46.9	46.9	45.4
Rth	Thermal resistance	K/W	0.0425	0.0416	0.0416	0.0424
2p	Number of poles	-	44	44	44	44
J	Rotor inertia	kg·m²	0.0214	0.0214	0.0214	0.0214
mr	Rotor mass	kg	3.60	3.60	3.60	3.60
ms	Stator mass	kg	11.3	11.4	11.4	11.3

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.074	0.074	0.074	0.074
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	7.5	7.7	7.7	7.5
Δpw	Max. pressure drop at qw	bar	0.3	0.3	0.3	0.3

Notes: (*) terminal to terminal.
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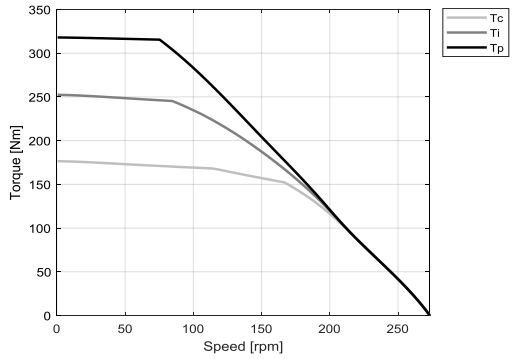
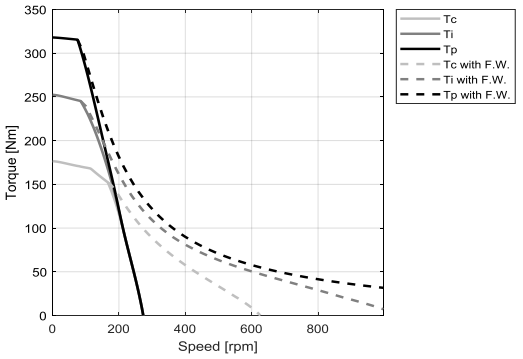
CONVENTIONAL TORQUE MOTOR TMB+0210-070

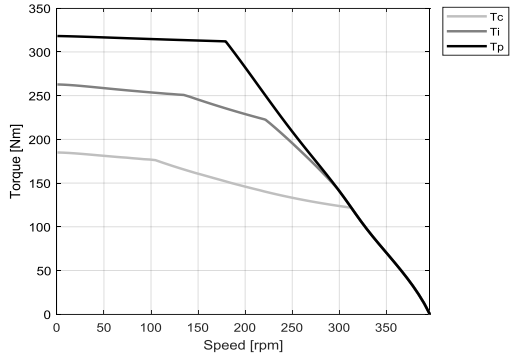
RA - WATER COOLING



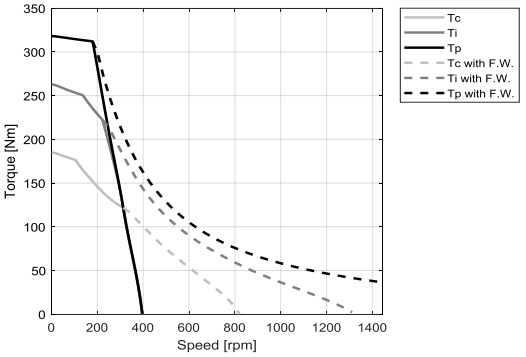
RA - WATER COOLING



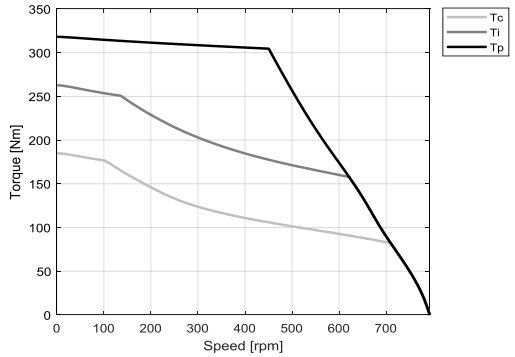
TA - WATER COOLING



TA - WATER COOLING



TB - WATER COOLING



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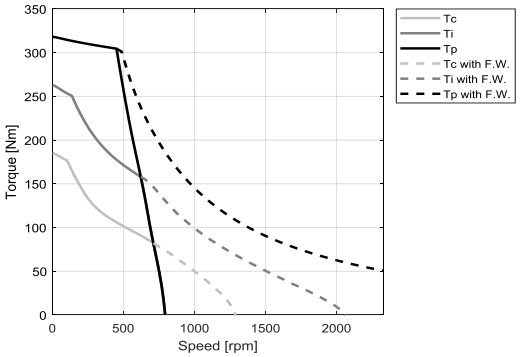
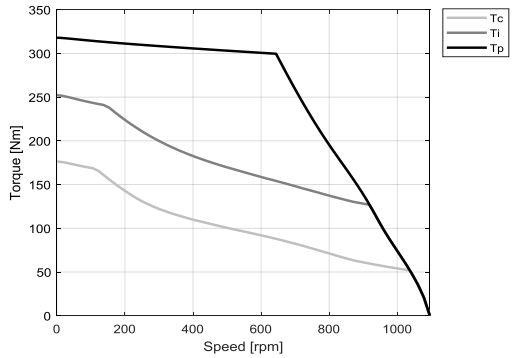


UB - WATER COOLING



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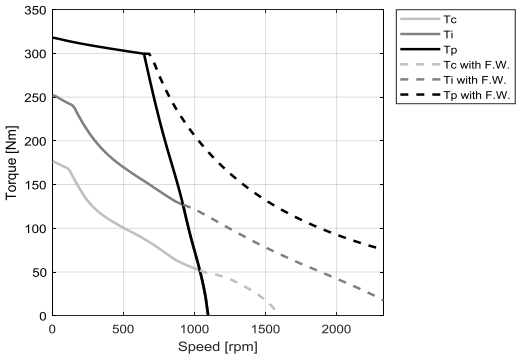

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0210-100

MOTOR PERFORMANCE		Winding codes	RA	TA	TB	UB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	460	461	461	460
Ti	Intermittent torque	Nm	370	386	386	371
Tc	Continuous torque	Nm	259	272	272	259
Ts	Standstill torque	Nm	202	213	213	202
Ip	Peak current	Arms	16.4	23.7	47.4	65.4
Ii	Intermittent current	Arms	12.4	19.0	38.0	49.6
Ic	Continuous current	Arms	7.82	12.0	24.0	31.3
Is	Standstill current	Arms	5.93	9.11	18.2	23.7
ns	Rated low speed	rpm	0.64	0.62	0.62	0.64
nm	Maximum speed without flux weakening	rpm	189	274	547	756
nm,FW	Maximum speed with flux weakening	rpm	430	583	962	1220
τon,p	Maximum ON time for peak cycle	s	6.5	8.0	8.0	6.4
τon,i	Maximum ON time for intermittent cycle	s	2.7	2.7	2.7	2.7
Pp	Power dissipation @ Ip	W	11300	10200	10200	11200
Pi	Power dissipation @ Ii	W	8400	8590	8590	8370
Pc	Power dissipation @ Ic	W	3360	3440	3440	3350
Td	Max. detent torque (average to peak)	Nm	2.1	2.1	2.1	2.1

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	36.7	25.3	12.7	9.18
Ku	Back EMF constant (*)	Vrms/(rad/s)	21.0	14.5	7.25	5.25
Km	Motor constant	Nm/√W	5.85	6.14	6.14	5.87
R20	Electrical resistance at 20°C (*)	Ohm	26.2	11.3	2.84	1.63
Ld/Lq	Electrical inductance (*)	mH	120 / 108	57.2 / 50.6	14.3 / 12.7	7.49 / 6.72
Isc	Maximum short-circuit current	Arms	9.20	13.3	26.6	36.8
nb	Base speed	rpm	76.5	195	472	681
nb,i	Base speed at intermittent duty cycle	rpm	12.1	98.8	407	608
nb,p	Base speed at peak duty cycle	rpm	8.81	99.0	298	436
nn	Rated speed	rpm	58.3	160	431	627
Tn	Rated torque	Nm	252	218	149	124
In	Rated current	Arms	7.79	9.73	13.3	15.5
τth	Thermal time constant	s	42.5	44.0	44.0	42.7
Rth	Thermal resistance	K/W	0.0294	0.0288	0.0288	0.0294
2p	Number of poles	-	44	44	44	44
J	Rotor inertia	kg·m²	0.0303	0.0303	0.0303	0.0303
mr	Rotor mass	kg	5.08	5.08	5.08	5.08
ms	Stator mass	kg	14.4	14.6	14.6	14.5

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.100	0.100	0.100	0.100
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	11	11	11	10
Δpw	Max. pressure drop at qw	bar	0.6	0.6	0.6	0.6

Notes: (*) terminal to terminal.
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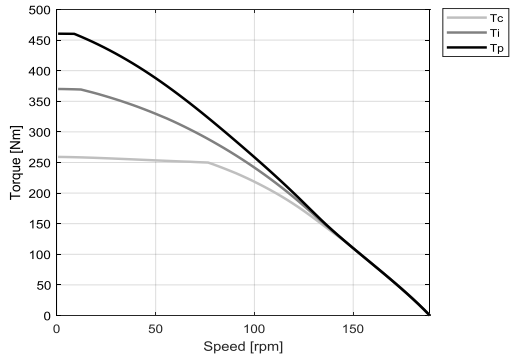
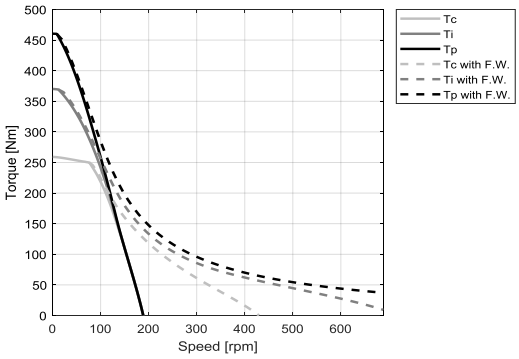
CONVENTIONAL TORQUE MOTOR TMB+0210-100

RA - WATER COOLING



RA - WATER COOLING



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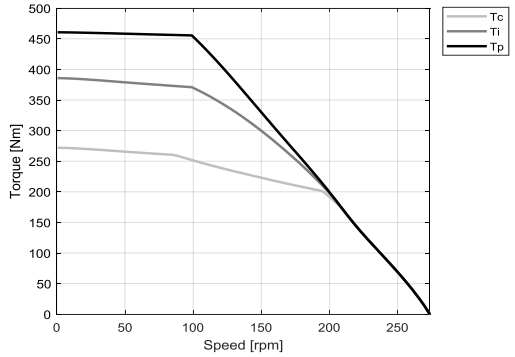

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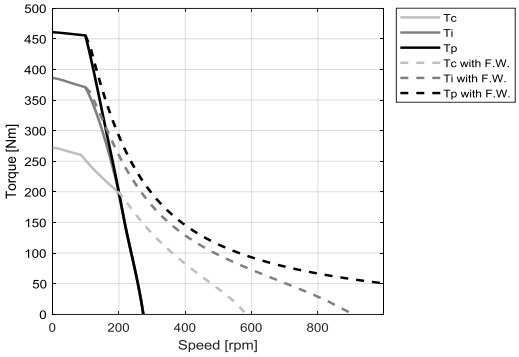

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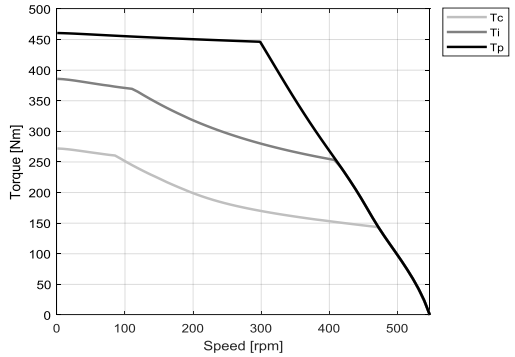

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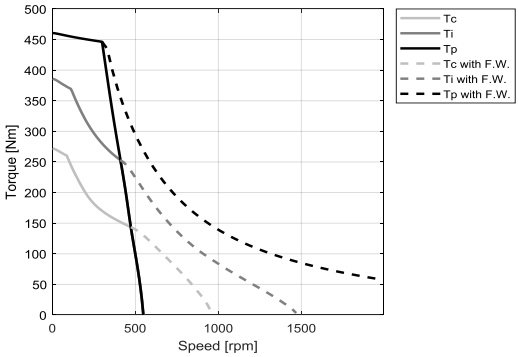
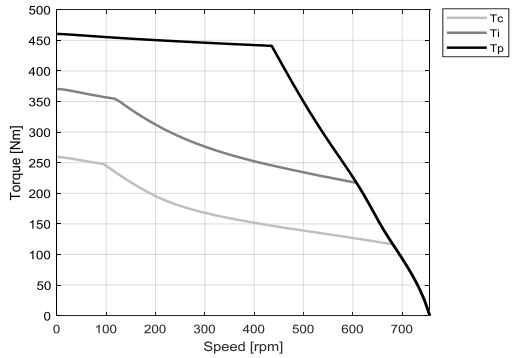


UB - WATER COOLING



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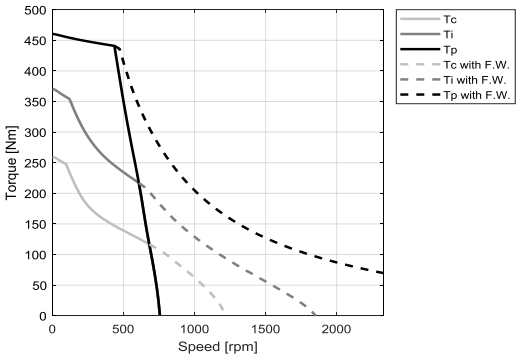

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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+0210-150

MOTOR PERFORMANCE		Winding codes	TA	UA	TB	UB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	698	697	698	697
Ti	Intermittent torque	Nm	578	554	578	554
Tc	Continuous torque	Nm	406	387	406	387
Ts	Standstill torque	Nm	317	301	317	301
Ip	Peak current	Arms	23.6	32.6	47.2	65.2
Ii	Intermittent current	Arms	18.7	24.3	37.3	48.7
Ic	Continuous current	Arms	11.8	15.4	23.6	30.8
Is	Standstill current	Arms	8.94	11.7	17.9	23.3
ns	Rated low speed	rpm	0.61	0.62	0.61	0.62
nm	Maximum speed without flux weakening	rpm	180	249	361	499
nm,FW	Maximum speed with flux weakening	rpm	403	515	683	850
τon,p	Maximum ON time for peak cycle	s	6.8	5.4	6.8	5.4
τon,i	Maximum ON time for intermittent cycle	s	2.7	2.7	2.7	2.7
Pp	Power dissipation @ Ip	W	14700	16200	14700	16200
Pi	Power dissipation @ Ii	W	11800	11500	11800	11500
Pc	Power dissipation @ Ic	W	4740	4600	4740	4600
Td	Max. detent torque (average to peak)	Nm	3.2	3.2	3.2	3.2

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	38.4	27.8	19.2	13.9
Ku	Back EMF constant (*)	Vrms/(rad/s)	22.0	15.9	11.0	7.96
Km	Motor constant	Nm/√W	7.72	7.38	7.72	7.38
R20	Electrical resistance at 20°C (*)	Ohm	16.5	9.46	4.12	2.36
Ld/Lq	Electrical inductance (*)	mH	86.0 / 76.4	45.1 / 40.6	21.5 / 19.1	11.3 / 10.1
Isc	Maximum short-circuit current	Arms	13.4	18.5	26.8	37.1
nb	Base speed	rpm	79.8	171	294	428
nb,i	Base speed at intermittent duty cycle	rpm	23.5	84.7	229	367
nb,p	Base speed at peak duty cycle	rpm	26.0	73.5	170	260
nn	Rated speed	rpm	62.3	138	262	389
Tn	Rated torque	Nm	393	324	258	221
In	Rated current	Arms	11.7	13.1	15.0	18.0
τth	Thermal time constant	s	45.0	43.7	45.0	43.7
Rth	Thermal resistance	K/W	0.0196	0.0200	0.0196	0.0200
2p	Number of poles	-	44	44	44	44
J	Rotor inertia	kg·m²	0.0457	0.0457	0.0457	0.0457
mr	Rotor mass	kg	7.67	7.67	7.67	7.67
ms	Stator mass	kg	21.2	21.0	21.2	21.0

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.140	0.140	0.140	0.140
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	15	14	15	14
Δpw	Max. pressure drop at qw	bar	1.1	1.0	1.1	1.0

Notes: (*) terminal to terminal.
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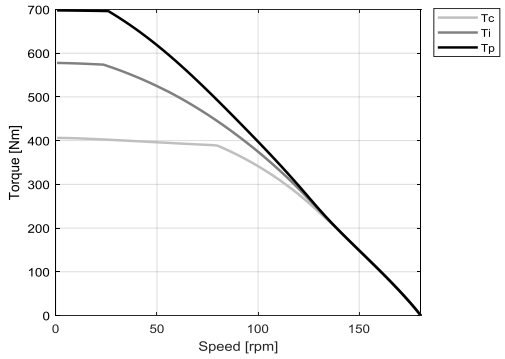
TA - WATER COOLING



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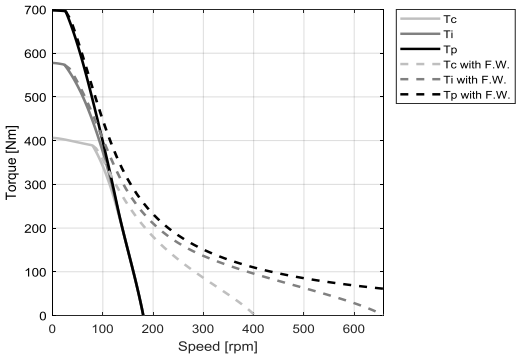
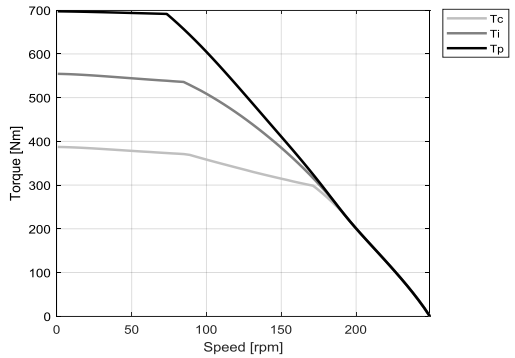


UA - WATER COOLING



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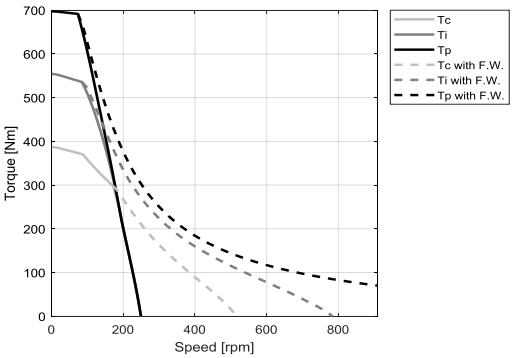

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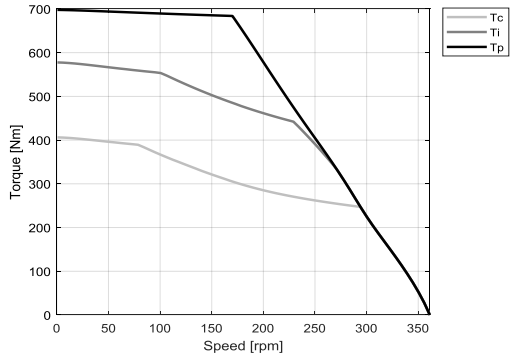

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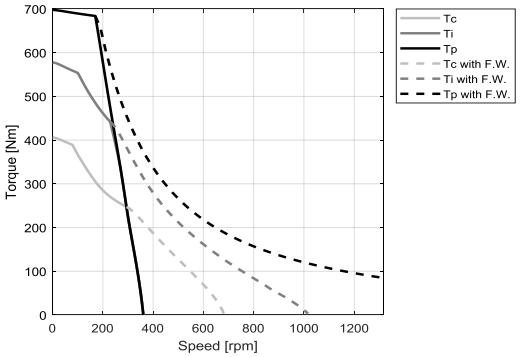

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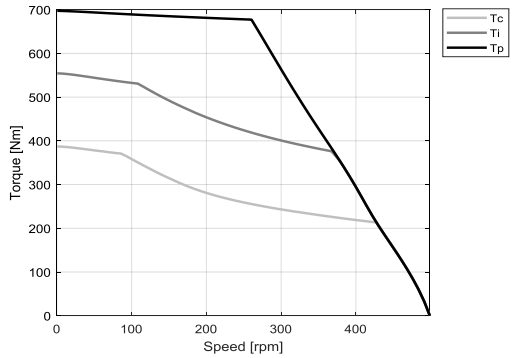

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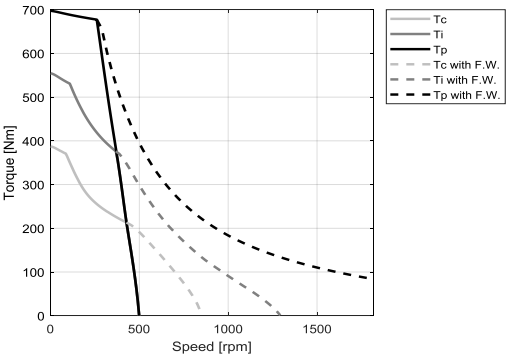

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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+0210-200

		Winding codes	UA	TB	UB	
MOTOR PERFORMANCE		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	
Tp	Peak torque	Nm	934	935	934	
Ti	Intermittent torque	Nm	729	761	729	
Tc	Continuous torque	Nm	507	533	507	
Ts	Standstill torque	Nm	394	416	394	
Ip	Peak current	Arms	32.6	47.2	65.1	
Ii	Intermittent current	Arms	23.7	36.4	47.3	
Ic	Continuous current	Arms	15.0	23.0	29.9	
Is	Standstill current	Arms	11.3	17.4	22.7	
ns	Rated low speed	rpm	0.63	0.61	0.63	
nm	Maximum speed without flux weakening	rpm	186	269	372	
nm,FW	Maximum speed with flux weakening	rpm	396	535	671	
τon,p	Maximum ON time for peak cycle	s	4.3	5.4	4.3	
τon,i	Maximum ON time for intermittent cycle	s	2.7	2.7	2.7	
Pp	Power dissipation @ Ip	W	21300	19400	21300	
Pi	Power dissipation @ Ii	W	14000	14500	14000	
Pc	Power dissipation @ Ic	W	5620	5810	5620	
Td	Max. detent torque (average to peak)	Nm	4.2	4.2	4.2	
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	37.3	25.7	18.6	
Ku	Back EMF constant (*)	Vrms/(rad/s)	21.3	14.7	10.7	
Km	Motor constant	Nm/√W	8.61	9.00	8.61	
R20	Electrical resistance at 20°C (*)	Ohm	12.5	5.45	3.12	
Ld/Lq	Electrical inductance (*)	mH	60.2 / 54.5	28.7 / 25.6	15.0 / 13.6	
Isc	Maximum short-circuit current	Arms	18.6	26.9	37.2	
nb	Base speed	rpm	89.8	206	305	
nb,i	Base speed at intermittent duty cycle	rpm	34.8	129	244	
nb,p	Base speed at peak duty cycle	rpm	18.8	103	171	
nn	Rated speed	rpm	70.8	175	273	
Tn	Rated torque	Nm	489	388	325	
In	Rated current	Arms	14.9	16.8	19.5	
τth	Thermal time constant	s	43.2	44.4	43.2	
Rth	Thermal resistance	K/W	0.0149	0.0147	0.0149	
2p	Number of poles	-	44	44	44	
J	Rotor inertia	kg·m²	0.0614	0.0614	0.0614	
mr	Rotor mass	kg	10.3	10.3	10.3	
ms	Stator mass	kg	27.0	27.3	27.0	
MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	
Di	Intermittent duty cycle	%	40	40	40	
Dp	Peak duty cycle	%	5.0	5.0	5.0	
Sr	Rotor exchange surface	m²	0.175	0.175	0.175	
θamb	Ambient temperature	°C	20	20	20	
θmax	Maximum coil temperature	°C	130	130	130	
θw	Inlet water temperature	°C	20	20	20	
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	
qw	Minimum water flow for Δθw	l/min	18	18	18	
Δpw	Max. pressure drop at qw	bar	2.0	2.1	2.0	

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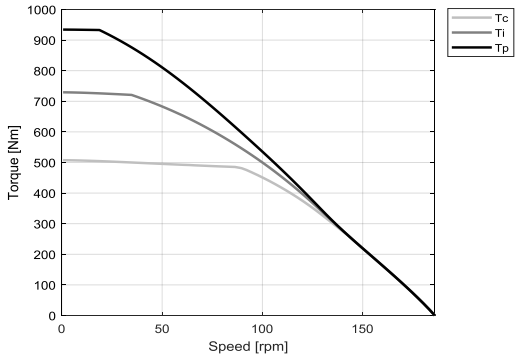
CONVENTIONAL TORQUE MOTOR TMB+0210-200

UA - WATER COOLING



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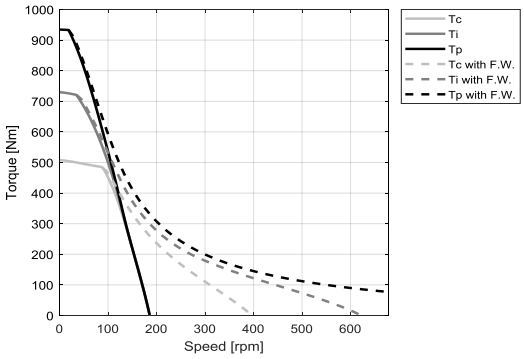

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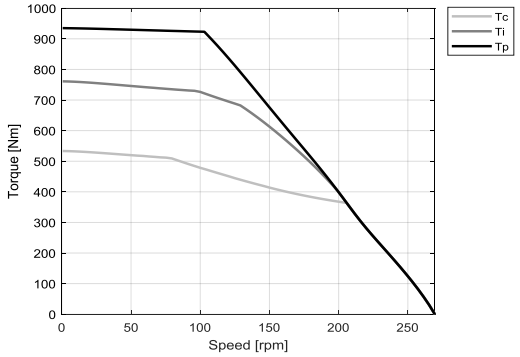

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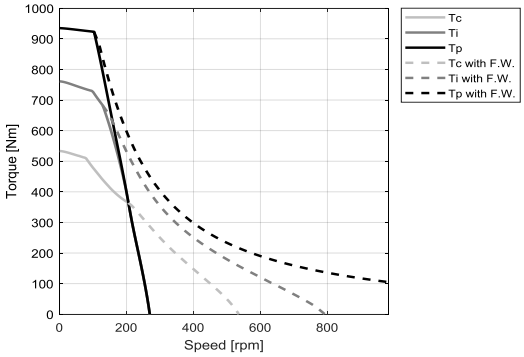

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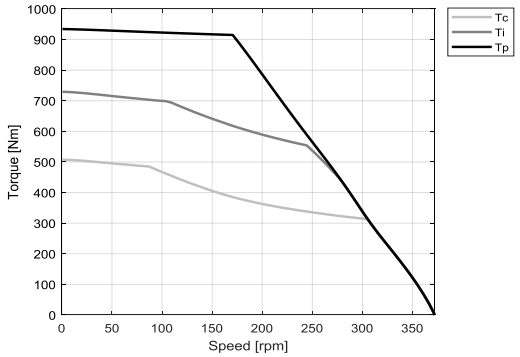

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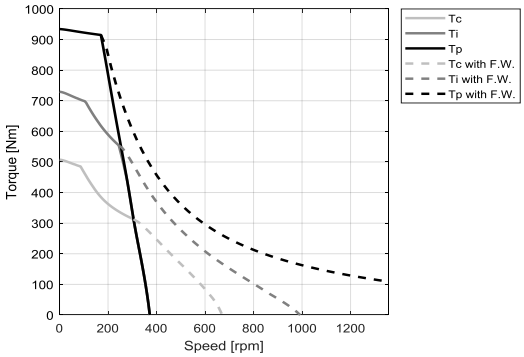

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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+0290-030

		Winding codes	RA	UA	TB	UB
MOTOR PERFORMANCE		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	286	286	286	286
Ti	Intermittent torque	Nm	192	187	193	187
Tc	Continuous torque	Nm	133	128	133	128
Ts	Standstill torque	Nm	103	99.2	103	99.2
Ip	Peak current	Arms	20.6	42.3	62.2	84.5
Ii	Intermittent current	Arms	11.9	23.5	36.1	47.0
Ic	Continuous current	Arms	7.50	14.9	22.9	29.7
Is	Standstill current	Arms	5.68	11.3	17.3	22.5
ns	Rated low speed	rpm	0.40	0.40	0.39	0.40
nm	Maximum speed without flux weakening	rpm	350	719	1060	1440
nm,FW	Maximum speed with flux weakening	rpm	835	1290	1540	1540
τon,p	Maximum ON time for peak cycle	s	3.7	3.3	4.0	3.3
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.8	2.9	2.8
Pp	Power dissipation @ Ip	W	9410	10000	9130	10000
Pi	Power dissipation @ Ii	W	3930	3840	3870	3840
Pc	Power dissipation @ Ic	W	1570	1540	1550	1540
Td	Max. detent torque (average to peak)	Nm	0.71	0.71	0.71	0.71

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	19.6	9.55	6.49	4.78
Ku	Back EMF constant (*)	Vrms/(rad/s)	11.3	5.51	3.74	2.76
Km	Motor constant	Nm/√W	4.43	4.32	4.49	4.32
R20	Electrical resistance at 20°C (*)	Ohm	13.1	3.26	1.39	0.816
Ld/Lq	Electrical inductance (*)	mH	42.3 / 39.2	10.0 / 9.32	4.62 / 4.27	2.50 / 2.33
Isc	Maximum short-circuit current	Arms	9.37	19.3	28.4	38.5
nb	Base speed	rpm	238	612	971	1380
nb,i	Base speed at intermittent duty cycle	rpm	166	502	835	1200
nb,p	Base speed at peak duty cycle	rpm	109	343	562	783
nn	Rated speed	rpm	199	550	854	836
Tn	Rated torque	Nm	124	88.2	68.0	68.4
In	Rated current	Arms	7.39	10.8	12.7	17.3
τth	Thermal time constant	s	45.3	45.3	46.8	45.3
Rth	Thermal resistance	K/W	0.0670	0.0685	0.0681	0.0685
2p	Number of poles	-	66	66	66	66
J	Rotor inertia	kg·m²	0.0380	0.0380	0.0380	0.0380
mr	Rotor mass	kg	2.73	2.73	2.73	2.73
ms	Stator mass	kg	8.78	8.81	8.86	8.81

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.056	0.056	0.056	0.056
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	4.9	4.8	4.8	4.8
Δpw	Max. pressure drop at qw	bar	0.2	0.2	0.2	0.2

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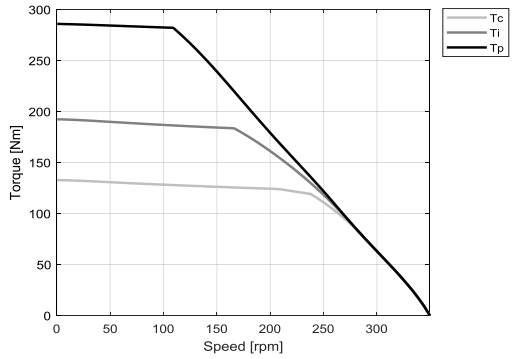
CONVENTIONAL TORQUE MOTOR TMB+0290-030

RA - WATER COOLING



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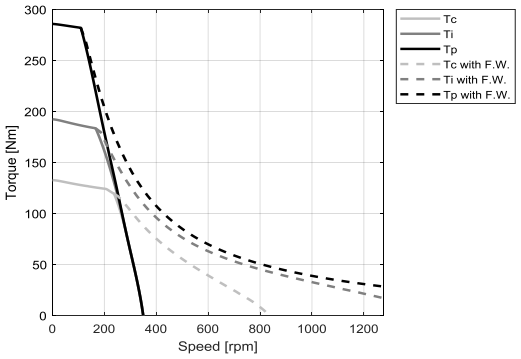

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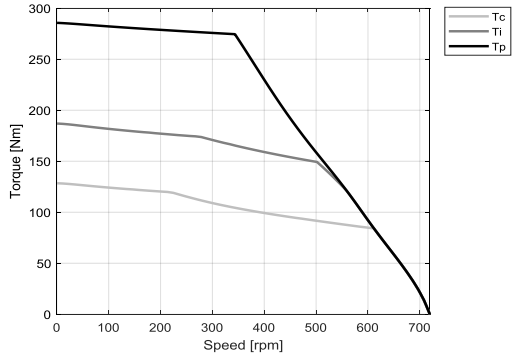

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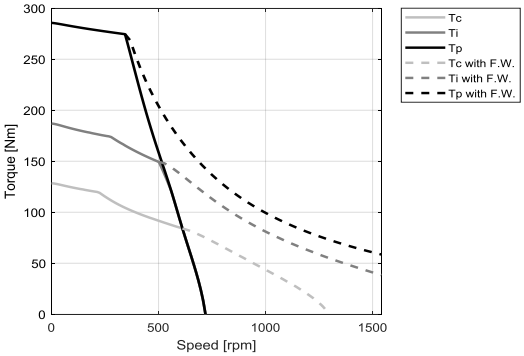
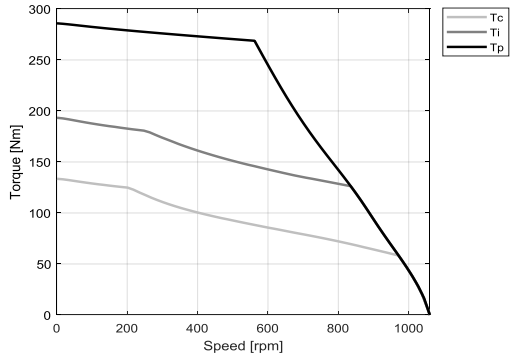


TB - WATER COOLING



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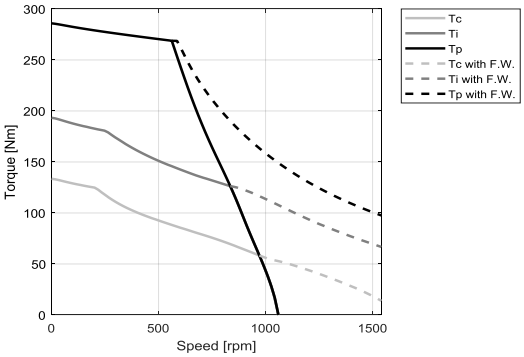
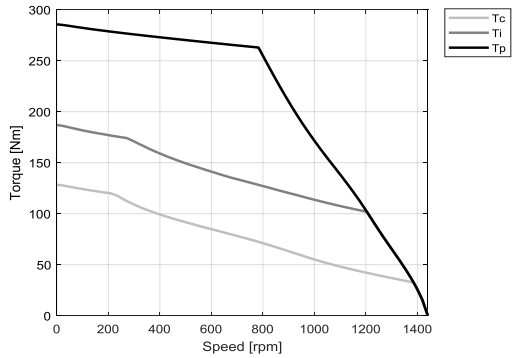
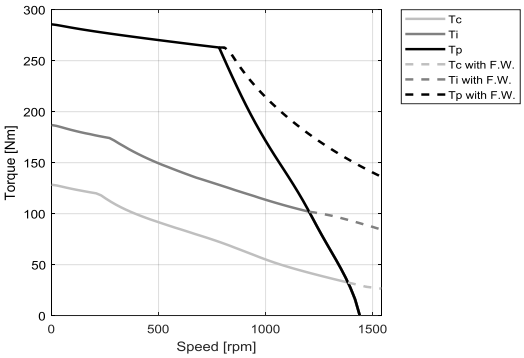


UB - WATER COOLING



UB - WATER COOLING



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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0290-050

MOTOR PERFORMANCE		Winding codes	RA	TA	TB	UB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	498	499	499	498
Ti	Intermittent torque	Nm	363	366	366	354
Tc	Continuous torque	Nm	249	252	252	242
Ts	Standstill torque	Nm	192	194	194	186
Ip	Peak current	Arms	19.0	28.8	57.7	78.4
Ii	Intermittent current	Arms	12.6	19.3	38.6	50.3
Ic	Continuous current	Arms	7.97	12.2	24.4	31.8
Is	Standstill current	Arms	6.04	9.25	18.5	24.1
ns	Rated low speed	rpm	0.45	0.43	0.43	0.45
nm	Maximum speed without flux weakening	rpm	200	303	607	825
nm,FW	Maximum speed with flux weakening	rpm	461	625	993	1220
τon,p	Maximum ON time for peak cycle	s	4.7	5.0	5.0	4.3
τon,i	Maximum ON time for intermittent cycle	s	2.8	2.8	2.8	2.7
Pp	Power dissipation @ Ip	W	11400	10900	10900	11900
Pi	Power dissipation @ Ii	W	6400	6310	6310	6250
Pc	Power dissipation @ Ic	W	2560	2520	2520	2500
Td	Max. detent torque (average to peak)	Nm	1.2	1.2	1.2	1.2

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	34.3	22.7	11.3	8.34
Ku	Back EMF constant (*)	Vrms/(rad/s)	19.8	13.1	6.54	4.82
Km	Motor constant	Nm/√W	6.43	6.56	6.56	6.31
R20	Electrical resistance at 20°C (*)	Ohm	19.0	7.97	1.99	1.17
Ld/Lq	Electrical inductance (*)	mH	69.4 / 63.7	30.3 / 27.7	7.57 / 6.93	4.10 / 3.79
Isc	Maximum short-circuit current	Arms	9.99	15.1	30.2	41.1
nb	Base speed	rpm	107	232	538	772
nb,i	Base speed at intermittent duty cycle	rpm	58.0	152	467	679
nb,p	Base speed at peak duty cycle	rpm	34.6	119	325	460
nn	Rated speed	rpm	88.5	197	491	590
Tn	Rated torque	Nm	239	200	138	118
In	Rated current	Arms	7.91	10.0	14.1	16.6
τth	Thermal time constant	s	40.7	41.8	41.8	40.6
Rth	Thermal resistance	K/W	0.0404	0.0410	0.0410	0.0412
2p	Number of poles	-	66	66	66	66
J	Rotor inertia	kg·m²	0.0633	0.0633	0.0633	0.0633
mr	Rotor mass	kg	4.54	4.54	4.54	4.54
ms	Stator mass	kg	11.9	12.0	12.0	11.9

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.082	0.082	0.082	0.082
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	8.0	7.9	7.9	7.8
Δpw	Max. pressure drop at qw	bar	0.3	0.3	0.3	0.3

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
Please refer to ETEL Integration Manual for the mass of the optional cooling jacket and the possible additional pressure drop.

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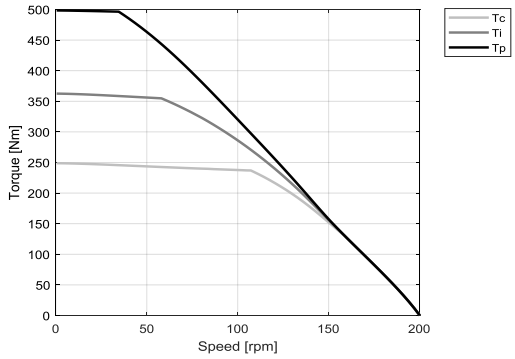
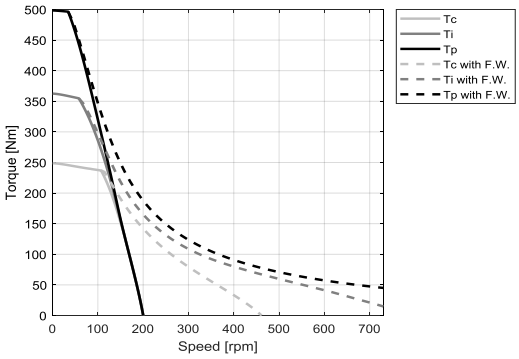
CONVENTIONAL TORQUE MOTOR TMB+0290-050

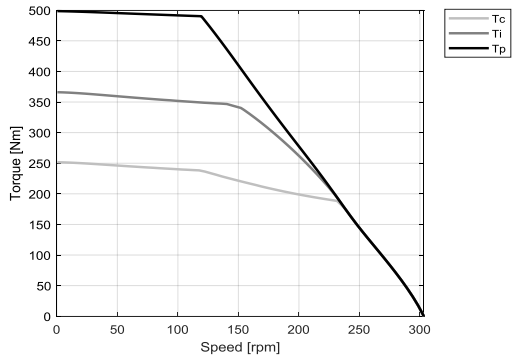
RA - WATER COOLING



RA - WATER COOLING



TA - WATER COOLING



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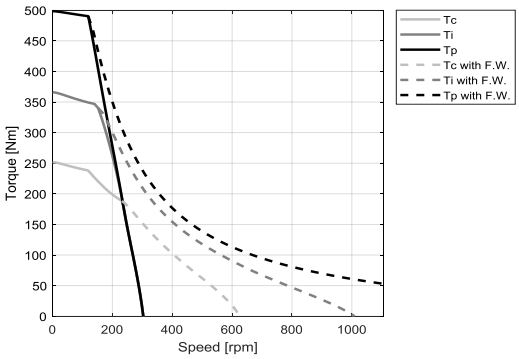

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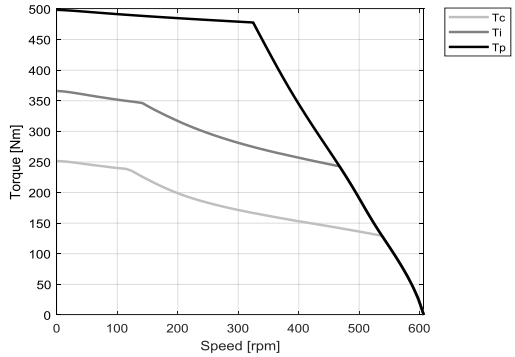

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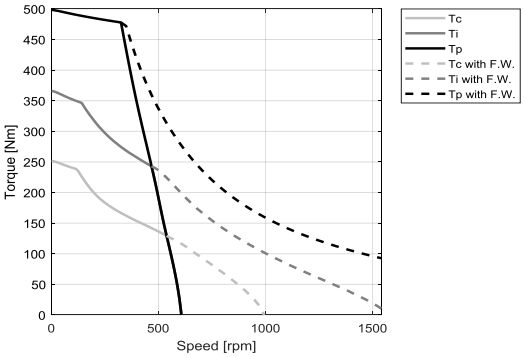
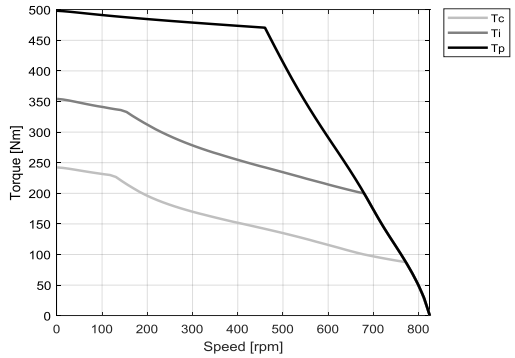


UB - WATER COOLING



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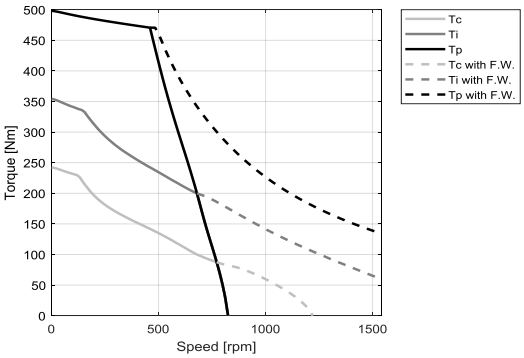

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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+0290-070

MOTOR PERFORMANCE		Winding codes	RA	UA	TB	UB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	685	710	711	710
Ti	Intermittent torque	Nm	528	518	534	518
Tc	Continuous torque	Nm	363	354	368	354
Ts	Standstill torque	Nm	279	272	284	272
Ip	Peak current	Arms	17.7	38.5	56.7	77.0
Ii	Intermittent current	Arms	12.8	25.6	39.4	51.3
Ic	Continuous current	Arms	8.09	16.2	24.9	32.4
Is	Standstill current	Arms	6.13	12.3	18.9	24.6
ns	Rated low speed	rpm	0.45	0.45	0.44	0.45
nm	Maximum speed without flux weakening	rpm	141	290	427	581
nm,FW	Maximum speed with flux weakening	rpm	310	530	685	858
τon,p	Maximum ON time for peak cycle	s	5.6	4.4	5.2	4.4
τon,i	Maximum ON time for intermittent cycle	s	2.8	2.7	2.8	2.7
Pp	Power dissipation @ Ip	W	12700	14900	13700	14900
Pi	Power dissipation @ Ii	W	8630	8430	8510	8430
Pc	Power dissipation @ Ic	W	3450	3370	3400	3370
Td	Max. detent torque (average to peak)	Nm	1.8	1.8	1.8	1.8

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	49.0	23.8	16.2	11.9
Ku	Back EMF constant (*)	Vrms/(rad/s)	28.1	13.7	9.29	6.84
Km	Motor constant	Nm/√W	8.01	7.88	8.19	7.88
R20	Electrical resistance at 20°C (*)	Ohm	25.0	6.09	2.60	1.52
Ld/Lq	Electrical inductance (*)	mH	93.8 / 86.3	22.2 / 20.5	10.2 / 9.38	5.55 / 5.13
Isc	Maximum short-circuit current	Arms	10.5	21.6	31.8	43.2
nb	Base speed	rpm	57.5	231	372	538
nb,i	Base speed at intermittent duty cycle	rpm	9.84	166	320	472
nb,p	Base speed at peak duty cycle	rpm	0.00	115	220	318
nn	Rated speed	rpm	43.8	200	338	444
Tn	Rated torque	Nm	355	255	207	168
In	Rated current	Arms	8.06	12.1	14.7	16.4
τth	Thermal time constant	s	40.3	40.1	41.2	40.1
Rth	Thermal resistance	K/W	0.0294	0.0299	0.0298	0.0299
2p	Number of poles	-	66	66	66	66
J	Rotor inertia	kg·m²	0.0887	0.0887	0.0887	0.0887
mr	Rotor mass	kg	6.36	6.36	6.36	6.36
ms	Stator mass	kg	15.3	15.4	15.5	15.4

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.110	0.110	0.110	0.110
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	11	11	11	11
Δpw	Max. pressure drop at qw	bar	0.5	0.5	0.5	0.5

Notes: (*) terminal to terminal.
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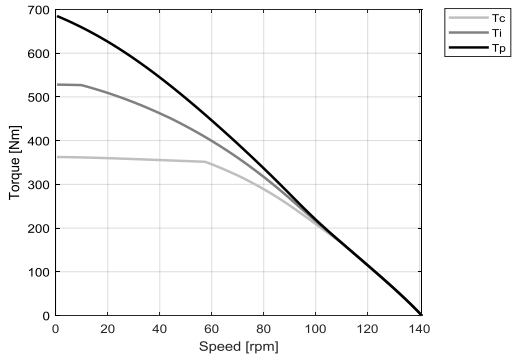
CONVENTIONAL TORQUE MOTOR TMB+0290-070

RA - WATER COOLING



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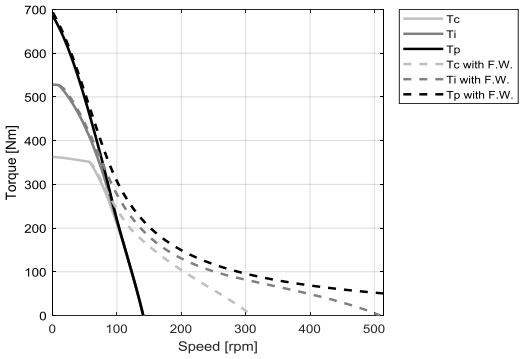
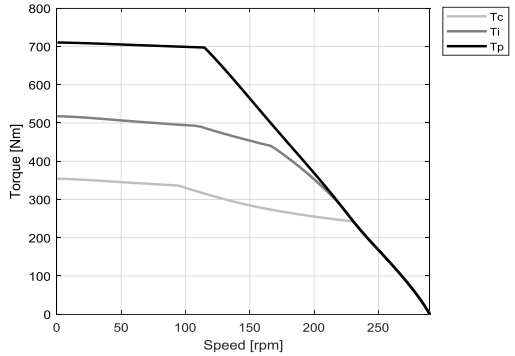


UA - WATER COOLING



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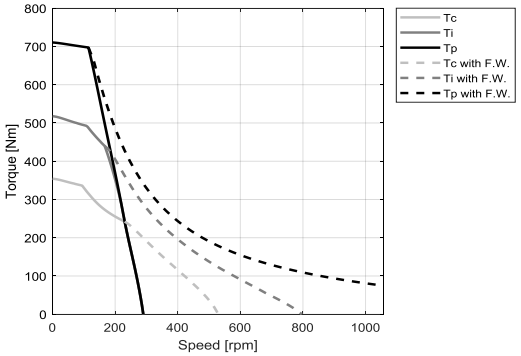
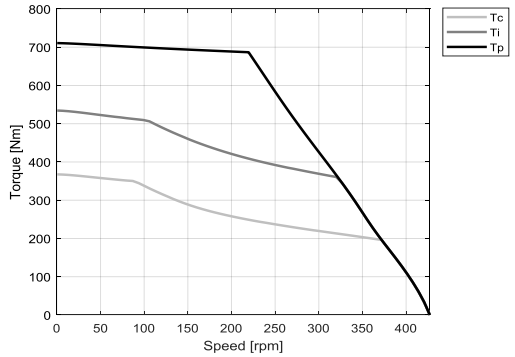


TB - WATER COOLING



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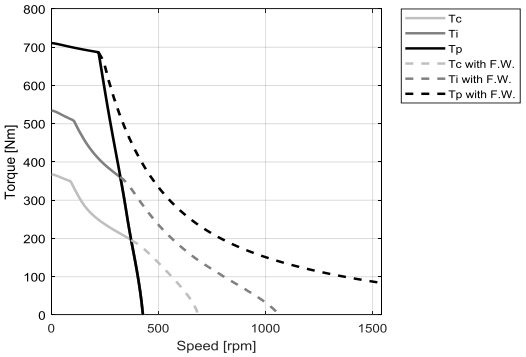

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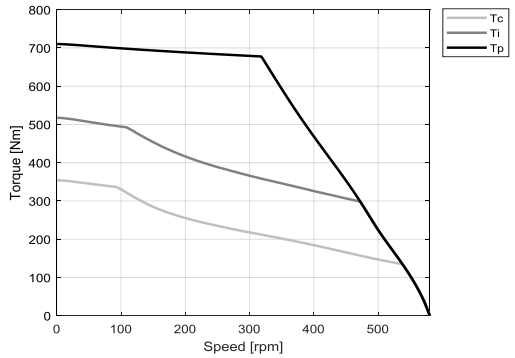

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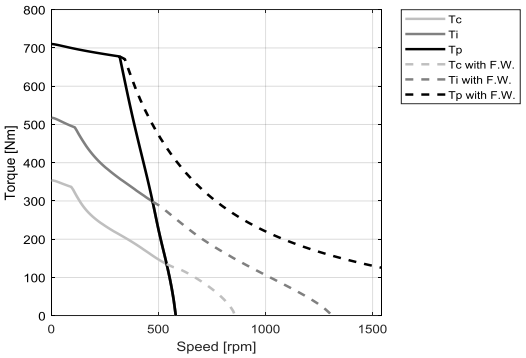

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0290-100

MOTOR PERFORMANCE		Winding codes	TA	UA	TB	UB
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	1030	1030	1030	1030
Ti	Intermittent torque	Nm	789	764	789	764
Tc	Continuous torque	Nm	543	523	543	523
Ts	Standstill torque	Nm	419	402	419	402
Ip	Peak current	Arms	28.0	38.0	55.9	76.0
Ii	Intermittent current	Arms	20.0	26.1	40.0	52.1
Ic	Continuous current	Arms	12.7	16.5	25.3	33.0
Is	Standstill current	Arms	9.58	12.5	19.2	25.0
ns	Rated low speed	rpm	0.47	0.48	0.47	0.48
nm	Maximum speed without flux weakening	rpm	147	200	295	401
nm,FW	Maximum speed with flux weakening	rpm	299	377	503	626
τon,p	Maximum ON time for peak cycle	s	5.0	4.2	5.0	4.2
τon,i	Maximum ON time for intermittent cycle	s	2.7	2.7	2.7	2.7
Pp	Power dissipation @ Ip	W	18000	19500	18000	19500
Pi	Power dissipation @ Ii	W	11800	11700	11800	11700
Pc	Power dissipation @ Ic	W	4730	4680	4730	4680
Td	Max. detent torque (average to peak)	Nm	2.5	2.5	2.5	2.5

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	46.9	34.5	23.5	17.3
Ku	Back EMF constant (*)	Vrms/(rad/s)	26.9	19.8	13.5	9.90
Km	Motor constant	Nm/√W	10.2	9.81	10.2	9.81
R20	Electrical resistance at 20°C (*)	Ohm	14.2	8.26	3.54	2.07
Ld/Lq	Electrical inductance (*)	mH	56.2 / 51.7	30.4 / 28.3	14.0 / 12.9	7.61 / 7.06
Isc	Maximum short-circuit current	Arms	16.8	22.8	33.5	45.5
nb	Base speed	rpm	70.8	142	245	352
nb,i	Base speed at intermittent duty cycle	rpm	27.7	74.2	200	309
nb,p	Base speed at peak duty cycle	rpm	17.1	55.2	137	207
nn	Rated speed	rpm	56.5	116	219	321
Tn	Rated torque	Nm	525	432	342	287
In	Rated current	Arms	12.6	14.0	16.4	18.9
τth	Thermal time constant	s	38.9	37.9	38.9	37.9
Rth	Thermal resistance	K/W	0.0207	0.0207	0.0207	0.0207
2p	Number of poles	-	66	66	66	66
J	Rotor inertia	kg·m²	0.126	0.126	0.126	0.126
mr	Rotor mass	kg	9.01	9.01	9.01	9.01
ms	Stator mass	kg	20.0	19.8	20.0	19.8

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.140	0.140	0.140	0.140
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	15	15	15	15
Δpw	Max. pressure drop at qw	bar	1.1	1.1	1.1	1.1

Notes: (*) terminal to terminal.
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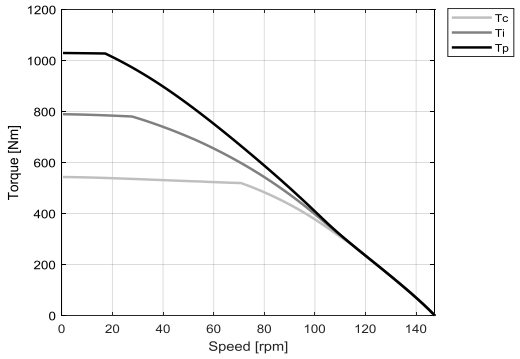
CONVENTIONAL TORQUE MOTOR TMB+0290-100

TA - WATER COOLING



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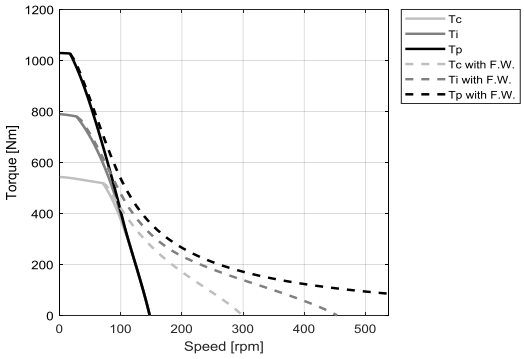
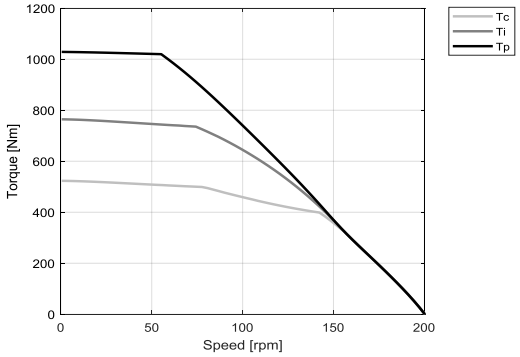


UA - WATER COOLING



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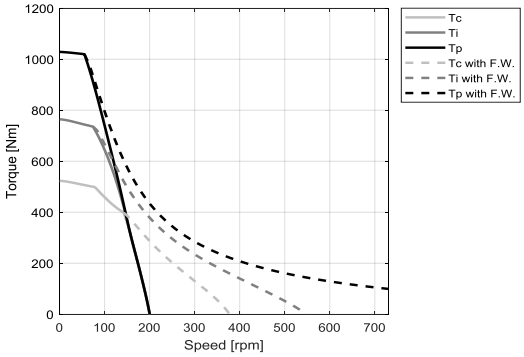
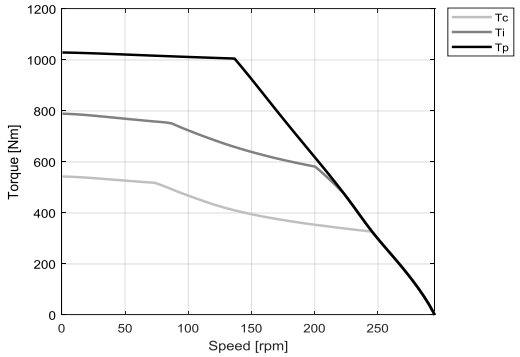


TB - WATER COOLING



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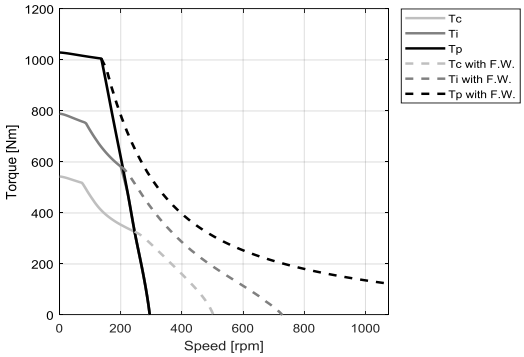
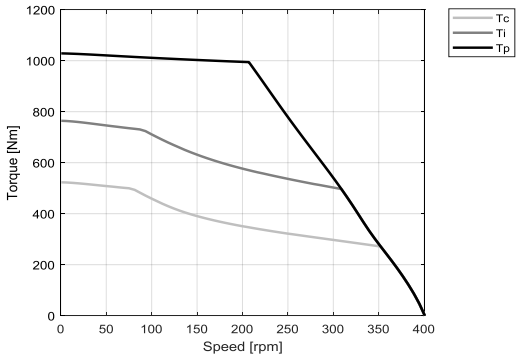
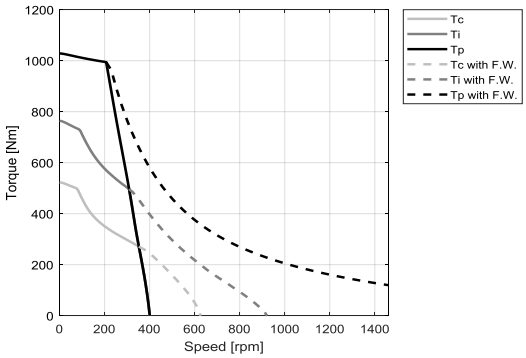


UB - WATER COOLING



UB - WATER COOLING



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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0290-150

MOTOR PERFORMANCE		Winding codes	UA	TB	UB	
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	
Tp	Peak torque	Nm	1540	1560	1560	
Ti	Intermittent torque	Nm	1150	1190	1150	
Tc	Continuous torque	Nm	782	813	782	
Ts	Standstill torque	Nm	600	625	600	
Ip	Peak current	Arms	36.9	55.3	75.2	
Ii	Intermittent current	Arms	25.5	39.2	51.1	
Ic	Continuous current	Arms	16.1	24.8	32.3	
Is	Standstill current	Arms	12.2	18.8	24.5	
ns	Rated low speed	rpm	0.47	0.46	0.47	
nm	Maximum speed without flux weakening	rpm	132	195	264	
nm,FW	Maximum speed with flux weakening	rpm	263	361	449	
τon,p	Maximum ON time for peak cycle	s	3.8	4.3	3.6	
τon,i	Maximum ON time for intermittent cycle	s	2.7	2.7	2.7	
Pp	Power dissipation @ Ip	W	26500	25500	27600	
Pi	Power dissipation @ Ii	W	15900	16200	15900	
Pc	Power dissipation @ Ic	W	6380	6480	6380	
Td	Max. detent torque (average to peak)	Nm	3.9	3.9	3.9	

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	52.4	35.6	26.2	
Ku	Back EMF constant (*)	Vrms/(rad/s)	30.0	20.4	15.0	
Km	Motor constant	Nm/√W	12.4	12.8	12.4	
R20	Electrical resistance at 20°C (*)	Ohm	12.0	5.13	2.99	
Ld/Lq	Electrical inductance (*)	mH	45.8 / 42.7	21.2 / 19.5	11.5 / 10.7	
Isc	Maximum short-circuit current	Arms	22.9	33.7	45.8	
nb	Base speed	rpm	60.0	145	216	
nb,i	Base speed at intermittent duty cycle	rpm	18.8	80.3	170	
nb,p	Base speed at peak duty cycle	rpm	0.00	64.7	112	
nn	Rated speed	rpm	47.1	122	191	
Tn	Rated torque	Nm	761	631	525	
In	Rated current	Arms	16.1	19.8	22.4	
τth	Thermal time constant	s	38.8	39.8	38.8	
Rth	Thermal resistance	K/W	0.0141	0.0140	0.0141	
2p	Number of poles	-	66	66	66	
J	Rotor inertia	kg·m²	0.189	0.189	0.189	
mr	Rotor mass	kg	13.6	13.6	13.6	
ms	Stator mass	kg	28.5	28.7	28.5	

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	
Di	Intermittent duty cycle	%	40	40	40	
Dp	Peak duty cycle	%	5.0	5.0	5.0	
Sr	Rotor exchange surface	m²	0.210	0.210	0.210	
θamb	Ambient temperature	°C	20	20	20	
θmax	Maximum coil temperature	°C	130	130	130	
θw	Inlet water temperature	°C	20	20	20	
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	
qw	Minimum water flow for Δθw	l/min	20	20	20	
Δpw	Max. pressure drop at qw	bar	2.0	2.1	2.0	

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
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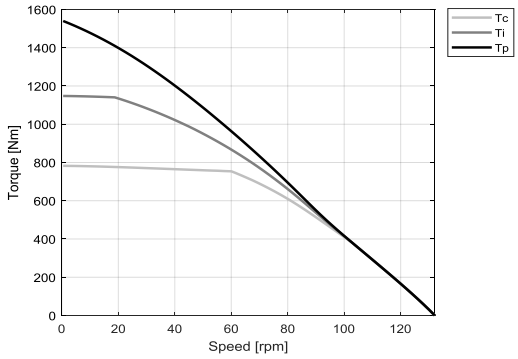
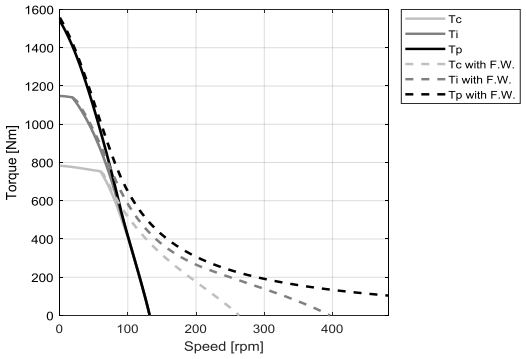
CONVENTIONAL TORQUE MOTOR TMB+0290-150

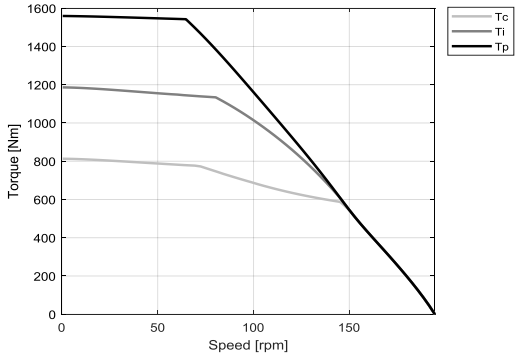
UA - WATER COOLING



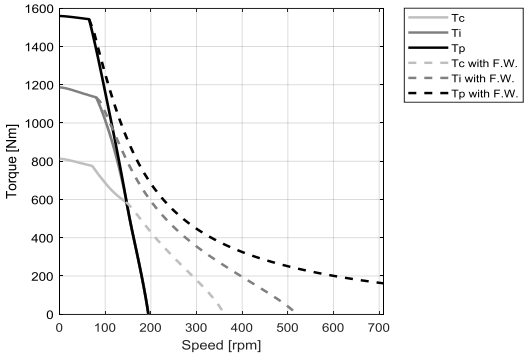
UA - WATER COOLING



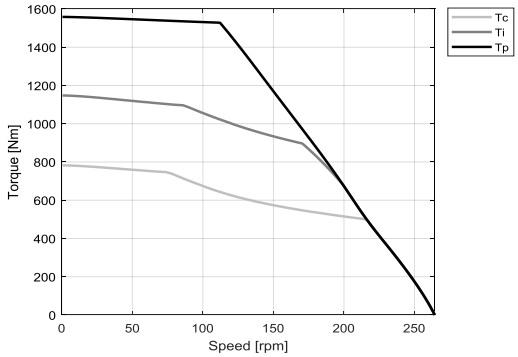
TB - WATER COOLING



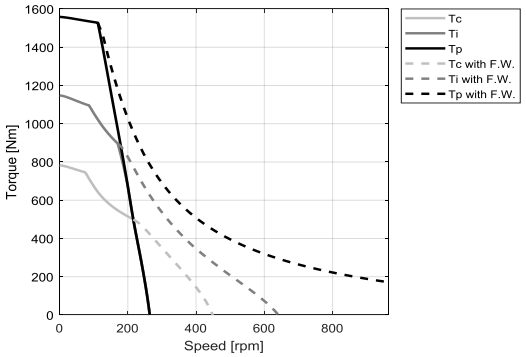
TB - WATER COOLING



UB - WATER COOLING



UB - WATER COOLING



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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0290-200

MOTOR PERFORMANCE		Winding codes	TB	UB		
		UNIT	WATER COOLING	WATER COOLING		
Tp	Peak torque	Nm	2090	2090		
Ti	Intermittent torque	Nm	1560	1510		
Tc	Continuous torque	Nm	1070	1020		
Ts	Standstill torque	Nm	817	781		
Ip	Peak current	Arms	55.1	74.8		
Ii	Intermittent current	Arms	38.1	49.5		
Ic	Continuous current	Arms	24.1	31.3		
Is	Standstill current	Arms	18.3	23.7		
ns	Rated low speed	rpm	0.46	0.47		
nm	Maximum speed without flux weakening	rpm	145	197		
nm,FW	Maximum speed with flux weakening	rpm	281	353		
τon,p	Maximum ON time for peak cycle	s	3.5	2.9		
τon,i	Maximum ON time for intermittent cycle	s	2.7	2.7		
Pp	Power dissipation @ Ip	W	33200	36000		
Pi	Power dissipation @ Ii	W	19700	19300		
Pc	Power dissipation @ Ic	W	7880	7710		
Td	Max. detent torque (average to peak)	Nm	5.2	5.2		

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	47.7	35.1		
Ku	Back EMF constant (*)	Vrms/(rad/s)	27.3	20.1		
Km	Motor constant	Nm/√W	15.0	14.4		
R20	Electrical resistance at 20°C (*)	Ohm	6.78	3.95		
Ld/Lq	Electrical inductance (*)	mH	28.3 / 26.3	15.3 / 14.4		
Isc	Maximum short-circuit current	Arms	33.8	46.0		
nb	Base speed	rpm	83.9	148		
nb,i	Base speed at intermittent duty cycle	rpm	41.5	87.4		
nb,p	Base speed at peak duty cycle	rpm	24.3	61.5		
nn	Rated speed	rpm	64.7	125		
Tn	Rated torque	Nm	1020	801		
In	Rated current	Arms	23.9	25.4		
τth	Thermal time constant	s	39.4	38.6		
Rth	Thermal resistance	K/W	0.0105	0.0105		
2p	Number of poles	-	66	66		
J	Rotor inertia	kg·m²	0.252	0.252		
mr	Rotor mass	kg	18.0	18.0		
ms	Stator mass	kg	37.0	36.8		

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600		
Di	Intermittent duty cycle	%	40	40		
Dp	Peak duty cycle	%	5.0	5.0		
Sr	Rotor exchange surface	m²	0.275	0.275		
θamb	Ambient temperature	°C	20	20		
θmax	Maximum coil temperature	°C	130	130		
θw	Inlet water temperature	°C	20	20		
Δθw	Water temperature difference for Pc	K	5.0	5.0		
qw	Minimum water flow for Δθw	l/min	25	24		
Δpw	Max. pressure drop at qw	bar	3.7	3.6		

Notes: (*) terminal to terminal.
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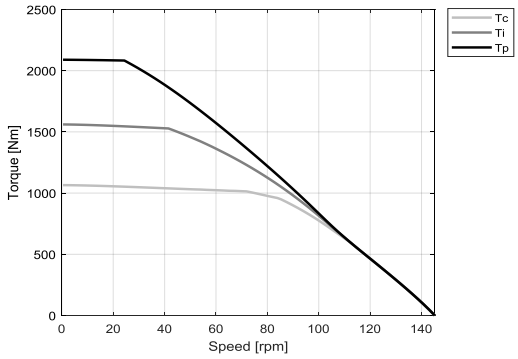
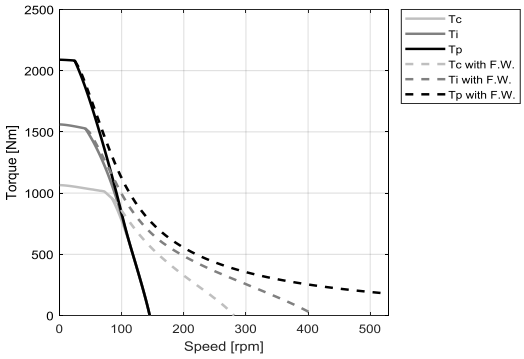
CONVENTIONAL TORQUE MOTOR TMB+0290-200

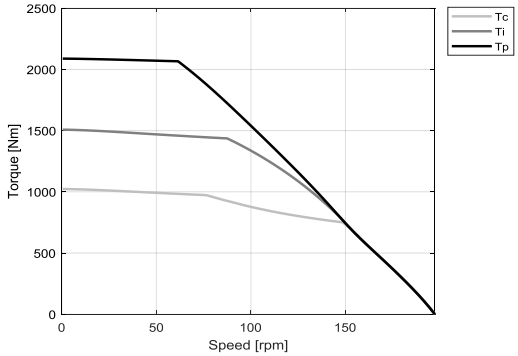
TB - WATER COOLING



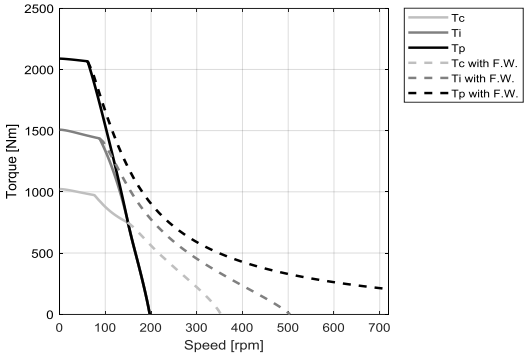
TB - WATER COOLING



UB - WATER COOLING



UB - WATER COOLING



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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+0291-030

MOTOR PERFORMANCE		Winding codes	SA	SB	UB	UD
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	260	260	260	260
Ti	Intermittent torque	Nm	188	188	190	190
Tc	Continuous torque	Nm	137	137	139	139
Ts	Standstill torque	Nm	110	110	111	111
Ip	Peak current	Arms	17.3	34.5	53.9	108
Ii	Intermittent current	Arms	10.0	20.0	31.8	63.6
Ic	Continuous current	Arms	6.32	12.6	20.1	40.2
Is	Standstill current	Arms	4.79	9.58	15.2	30.5
ns	Rated low speed	rpm	0.24	0.24	0.24	0.24
nm	Maximum speed without flux weakening	rpm	259	518	809	1620
nm,FW	Maximum speed with flux weakening	rpm	792	1190	1480	1650
τon,p	Maximum ON time for peak cycle	s	8.5	8.5	9.0	9.0
τon,i	Maximum ON time for intermittent cycle	s	3.0	3.0	3.0	3.0
Pp	Power dissipation @ Ip	W	8410	8410	8240	8240
Pi	Power dissipation @ Ii	W	3550	3550	3620	3620
Pc	Power dissipation @ Ic	W	1420	1420	1450	1450
Td	Max. detent torque (average to peak)	Nm	1.1	1.1	1.1	1.1

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	26.6	13.3	8.52	4.26
Ku	Back EMF constant (*)	Vrms/(rad/s)	15.3	7.67	4.91	2.46
Km	Motor constant	Nm/√W	5.34	5.34	5.38	5.38
R20	Electrical resistance at 20°C (*)	Ohm	16.6	4.15	1.67	0.418
Ld/Lq	Electrical inductance (*)	mH	150 / 133	37.5 / 33.2	15.4 / 13.5	3.84 / 3.38
Isc	Maximum short-circuit current	Arms	5.37	10.7	16.8	33.5
nb	Base speed	rpm	159	407	704	N/A
nb,i	Base speed at intermittent duty cycle	rpm	109	320	574	1340
nb,p	Base speed at peak duty cycle	rpm	71.6	228	392	836
nn	Rated speed	rpm	134	358	641	962
Tn	Rated torque	Nm	125	96.1	70.2	53.4
In	Rated current	Arms	5.92	8.69	9.75	15.2
τth	Thermal time constant	s	111	111	112	112
Rth	Thermal resistance	K/W	0.0748	0.0748	0.0733	0.0733
2p	Number of poles	-	44	44	44	44
J	Rotor inertia	kg·m²	0.0242	0.0242	0.0242	0.0242
mr	Rotor mass	kg	2.12	2.12	2.12	2.12
ms	Stator mass	kg	13.0	13.0	13.1	13.1

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.056	0.056	0.056	0.056
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	4.4	4.4	4.5	4.5
Δpw	Max. pressure drop at qw	bar	0.1	0.1	0.1	0.1

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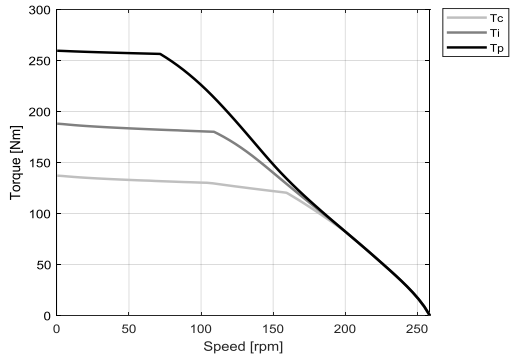
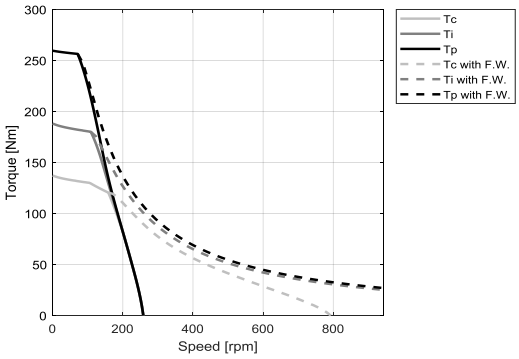
CONVENTIONAL TORQUE MOTOR TMB+0291-030

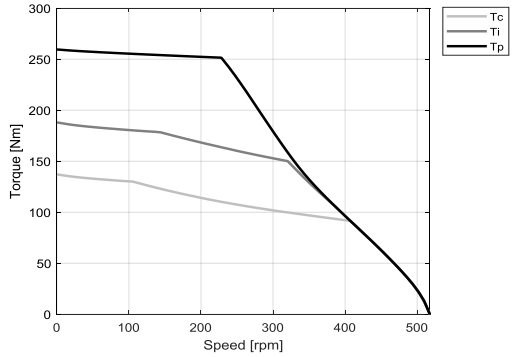
SA - WATER COOLING



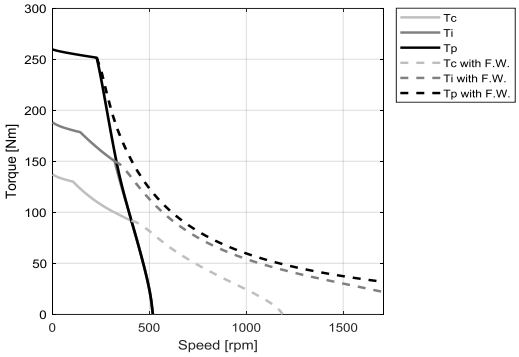
SA - WATER COOLING



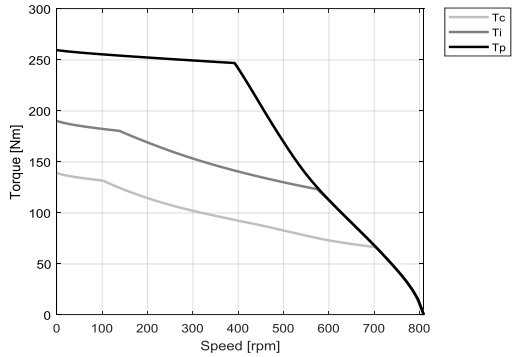
SB - WATER COOLING



SB - WATER COOLING



UB - WATER COOLING



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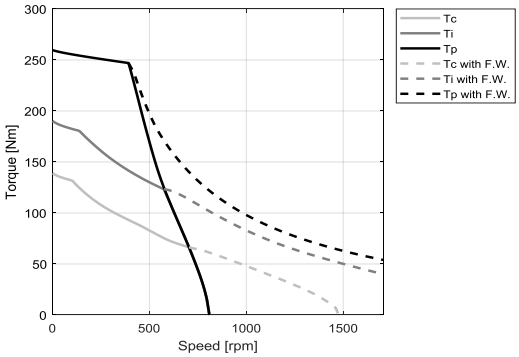

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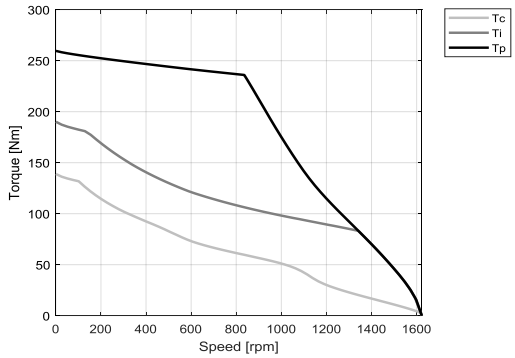

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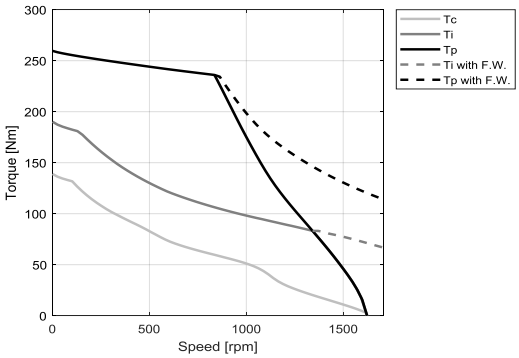

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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+0291-050

MOTOR PERFORMANCE		Winding codes	SA	UA	UB	UD
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	434	434	434	434
Ti	Intermittent torque	Nm	342	346	346	346
Tc	Continuous torque	Nm	248	251	251	251
Ts	Standstill torque	Nm	198	201	201	201
Ip	Peak current	Arms	15.3	23.9	47.8	95.6
Ii	Intermittent current	Arms	10.6	17.0	33.9	67.8
Ic	Continuous current	Arms	6.73	10.7	21.4	42.9
Is	Standstill current	Arms	5.10	8.12	16.2	32.5
ns	Rated low speed	rpm	0.28	0.28	0.28	0.28
nm	Maximum speed without flux weakening	rpm	155	243	486	973
nm,FW	Maximum speed with flux weakening	rpm	466	601	959	1290
τon,p	Maximum ON time for peak cycle	s	12	13	13	13
τon,i	Maximum ON time for intermittent cycle	s	3.0	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	8810	8610	8610	8610
Pi	Power dissipation @ Ii	W	5560	5660	5660	5660
Pc	Power dissipation @ Ic	W	2220	2270	2270	2270
Td	Max. detent torque (average to peak)	Nm	1.9	1.9	1.9	1.9

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	44.5	28.5	14.2	7.12
Ku	Back EMF constant (*)	Vrms/(rad/s)	25.6	16.4	8.18	4.09
Km	Motor constant	Nm/√W	7.58	7.65	7.65	7.65
R20	Electrical resistance at 20°C (*)	Ohm	23.0	9.25	2.31	0.578
Ld/Lq	Electrical inductance (*)	mH	234 / 204	95.8 / 83.0	24.0 / 20.7	5.99 / 5.19
Isc	Maximum short-circuit current	Arms	5.74	8.97	17.9	35.9
nb	Base speed	rpm	83.5	172	414	943
nb,i	Base speed at intermittent duty cycle	rpm	41.5	123	339	795
nb,p	Base speed at peak duty cycle	rpm	30.6	94.5	244	532
nn	Rated speed	rpm	66.4	148	373	726
Tn	Rated torque	Nm	229	193	136	87.7
In	Rated current	Arms	6.39	8.08	11.0	14.7
τth	Thermal time constant	s	97.7	98.1	98.1	98.1
Rth	Thermal resistance	K/W	0.0473	0.0464	0.0464	0.0464
2p	Number of poles	-	44	44	44	44
J	Rotor inertia	kg·m²	0.0405	0.0405	0.0405	0.0405
mr	Rotor mass	kg	3.54	3.54	3.54	3.54
ms	Stator mass	kg	17.5	17.5	17.5	17.5

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.082	0.082	0.082	0.082
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	6.9	7.1	7.1	7.1
Δpw	Max. pressure drop at qw	bar	0.3	0.3	0.3	0.3

Notes: (*) terminal to terminal.
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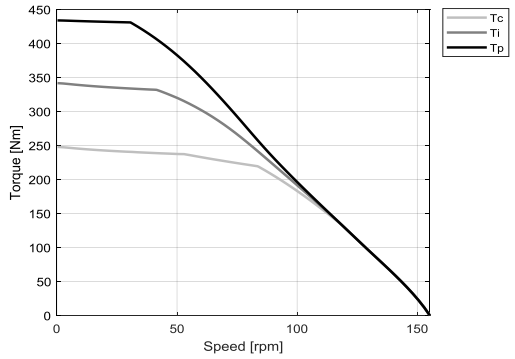
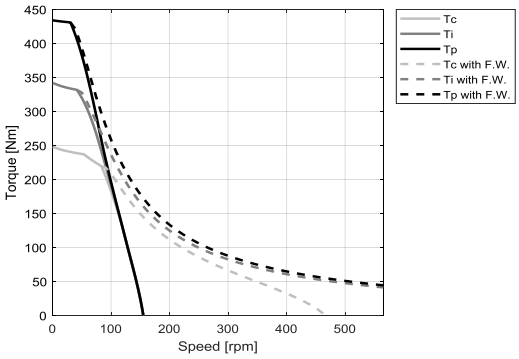
CONVENTIONAL TORQUE MOTOR TMB+0291-050

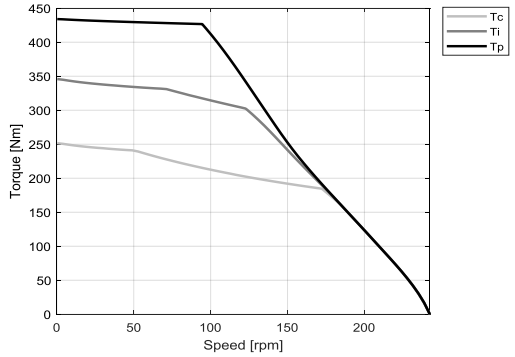
SA - WATER COOLING



SA - WATER COOLING



UA - WATER COOLING



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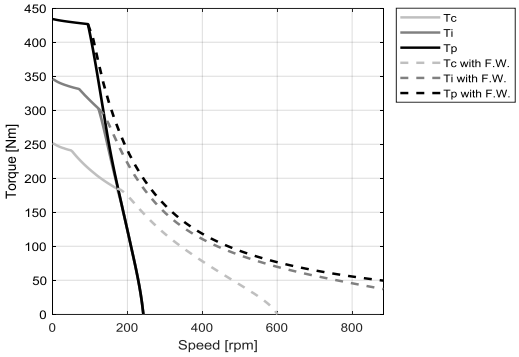

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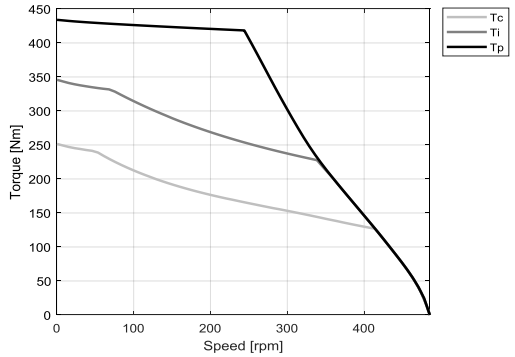

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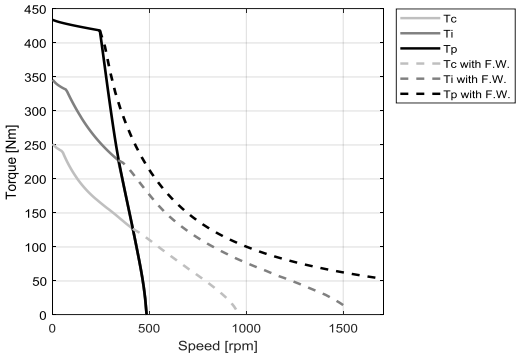

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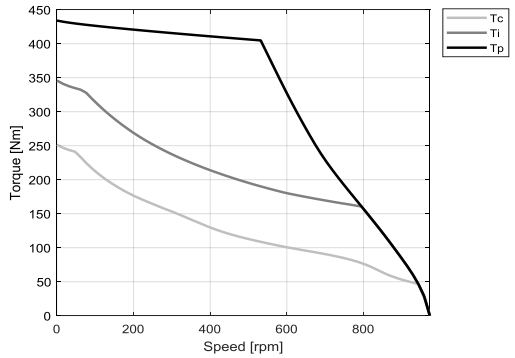

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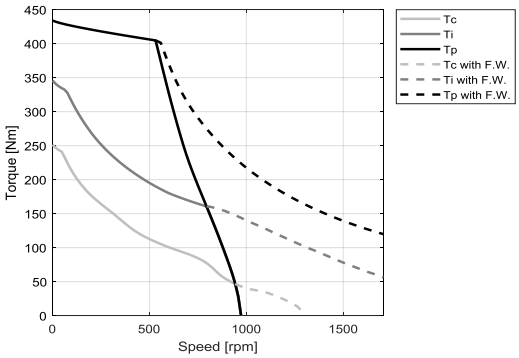

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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+0291-070

MOTOR PERFORMANCE		Winding codes	SA	SB	SD	UD
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	608	608	608	608
Ti	Intermittent torque	Nm	491	491	491	497
Tc	Continuous torque	Nm	356	356	356	362
Ts	Standstill torque	Nm	285	285	285	289
Ip	Peak current	Arms	14.9	29.8	59.6	93.1
Ii	Intermittent current	Arms	10.9	21.8	43.5	69.4
Ic	Continuous current	Arms	6.88	13.8	27.5	43.9
Is	Standstill current	Arms	5.21	10.4	20.8	33.2
ns	Rated low speed	rpm	0.29	0.29	0.29	0.29
nm	Maximum speed without flux weakening	rpm	111	222	444	695
nm,FW	Maximum speed with flux weakening	rpm	321	490	784	943
τon,p	Maximum ON time for peak cycle	s	13	13	13	14
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	10600	10600	10600	10400
Pi	Power dissipation @ Ii	W	7420	7420	7420	7560
Pc	Power dissipation @ Ic	W	2970	2970	2970	3020
Td	Max. detent torque (average to peak)	Nm	2.6	2.6	2.6	2.6

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	62.4	31.2	15.6	9.98
Ku	Back EMF constant (*)	Vrms/(rad/s)	35.8	17.9	8.95	5.73
Km	Motor constant	Nm/√W	9.38	9.38	9.38	9.48
R20	Electrical resistance at 20°C (*)	Ohm	29.5	7.38	1.84	0.740
Ld/Lq	Electrical inductance (*)	mH	310 / 270	77.6 / 67.4	19.4 / 16.9	7.94 / 6.86
Isc	Maximum short-circuit current	Arms	6.06	12.1	24.2	37.9
nb	Base speed	rpm	48.1	167	393	671
nb,i	Base speed at intermittent duty cycle	rpm	6.90	124	332	573
nb,p	Base speed at peak duty cycle	rpm	1.24	89.6	232	388
nn	Rated speed	rpm	32.8	145	361	536
Tn	Rated torque	Nm	343	251	164	125
In	Rated current	Arms	6.84	9.37	12.0	14.7
τth	Thermal time constant	s	94.1	94.1	94.1	94.6
Rth	Thermal resistance	K/W	0.0350	0.0350	0.0350	0.0343
2p	Number of poles	-	44	44	44	44
J	Rotor inertia	kg·m²	0.0567	0.0567	0.0567	0.0567
mr	Rotor mass	kg	4.96	4.96	4.96	4.96
ms	Stator mass	kg	22.2	22.2	22.2	22.3

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.110	0.110	0.110	0.110
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	9.3	9.3	9.3	9.4
Δpw	Max. pressure drop at qw	bar	0.4	0.4	0.4	0.4

Notes: (*) terminal to terminal.
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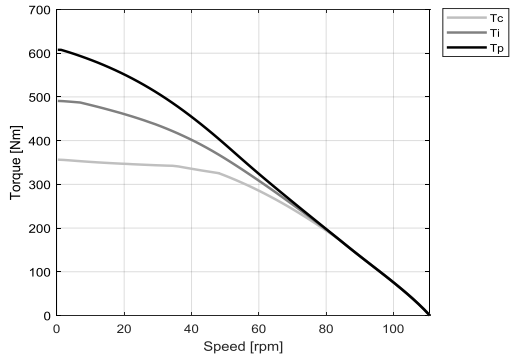
SA - WATER COOLING



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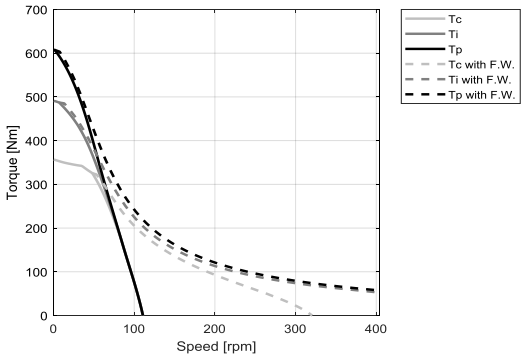
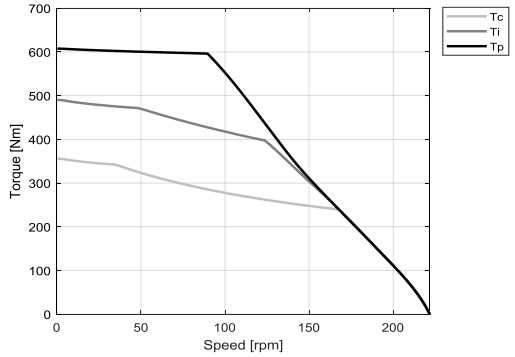


SB - WATER COOLING



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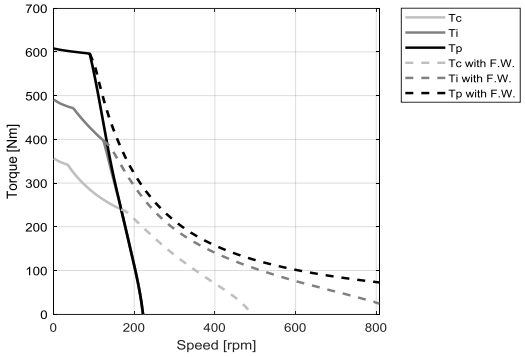
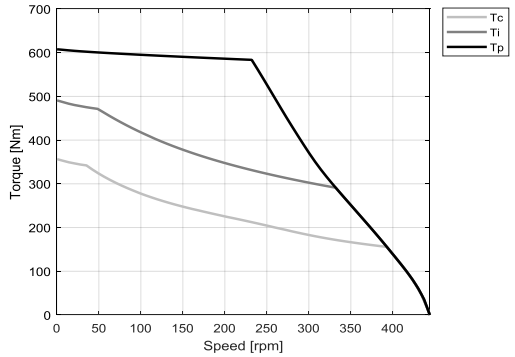


SD - WATER COOLING



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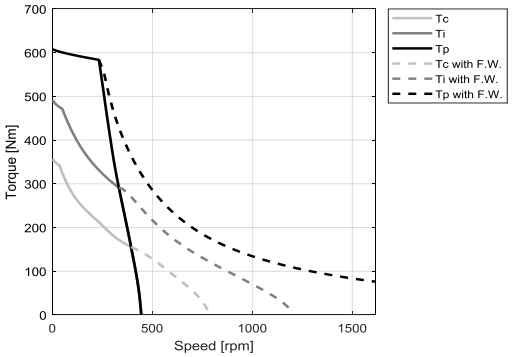
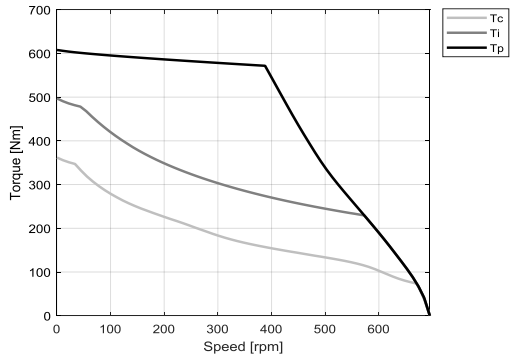


UD - WATER COOLING



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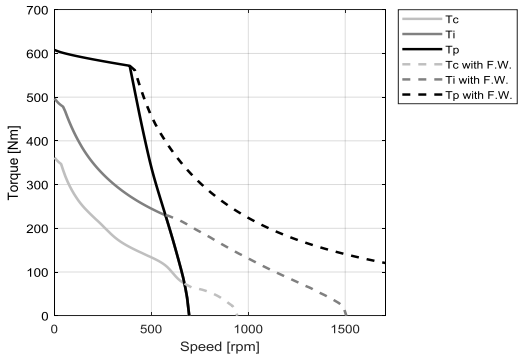

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CONVENTIONAL TORQUE MOTOR TMB+0291-100

MOTOR PERFORMANCE		Winding codes	UA	SB	UB	UD
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	869	868	869	869
Ti	Intermittent torque	Nm	726	717	726	726
Tc	Continuous torque	Nm	529	521	529	529
Ts	Standstill torque	Nm	424	416	424	424
Ip	Peak current	Arms	22.8	29.2	45.6	91.3
Ii	Intermittent current	Arms	17.7	22.2	35.5	70.9
Ic	Continuous current	Arms	11.2	14.1	22.4	44.9
Is	Standstill current	Arms	8.50	10.7	17.0	34.0
ns	Rated low speed	rpm	0.31	0.31	0.31	0.31
nm	Maximum speed without flux weakening	rpm	121	155	243	486
nm,FW	Maximum speed with flux weakening	rpm	300	352	485	806
τon,p	Maximum ON time for peak cycle	s	15	14	15	15
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	13200	13600	13200	13200
Pi	Power dissipation @ Ii	W	10500	10300	10500	10500
Pc	Power dissipation @ Ic	W	4190	4120	4190	4190
Td	Max. detent torque (average to peak)	Nm	3.8	3.8	3.8	3.8

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	57.1	44.6	28.6	14.3
Ku	Back EMF constant (*)	Vrms/(rad/s)	32.7	25.6	16.4	8.18
Km	Motor constant	Nm/√W	11.7	11.6	11.7	11.7
R20	Electrical resistance at 20°C (*)	Ohm	15.8	9.85	3.94	0.986
Ld/Lq	Electrical inductance (*)	mH	172 / 148	105 / 91.2	43.1 / 37.1	10.8 / 9.26
Isc	Maximum short-circuit current	Arms	9.96	12.8	19.9	39.8
nb	Base speed	rpm	72.7	109	197	443
nb,i	Base speed at intermittent duty cycle	rpm	23.5	69.9	159	389
nb,p	Base speed at peak duty cycle	rpm	24.2	49.8	113	272
nn	Rated speed	rpm	58.6	92.0	175	411
Tn	Rated torque	Nm	434	387	320	210
In	Rated current	Arms	9.10	10.1	12.8	16.9
τth	Thermal time constant	s	88.4	88.0	88.4	88.4
Rth	Thermal resistance	K/W	0.0243	0.0247	0.0243	0.0243
2p	Number of poles	-	44	44	44	44
J	Rotor inertia	kg·m²	0.0804	0.0804	0.0804	0.0804
mr	Rotor mass	kg	7.02	7.02	7.02	7.02
ms	Stator mass	kg	28.8	28.7	28.8	28.8

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.140	0.140	0.140	0.140
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	13	13	13	13
Δpw	Max. pressure drop at qw	bar	0.9	0.9	0.9	0.9

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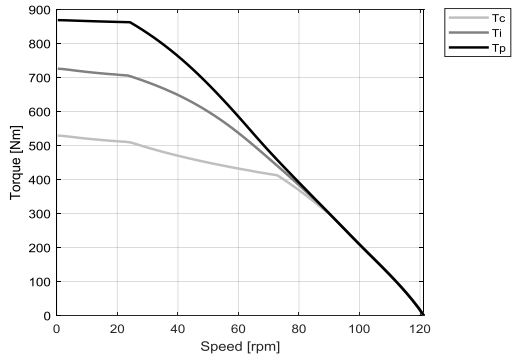
CONVENTIONAL TORQUE MOTOR TMB+0291-100

UA - WATER COOLING



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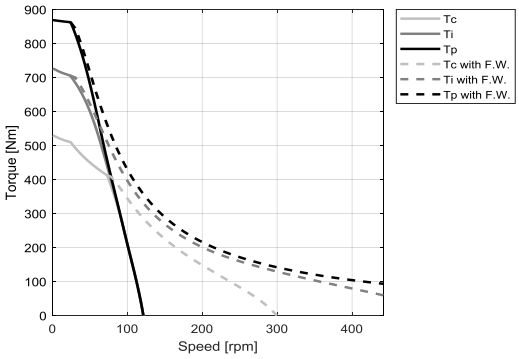

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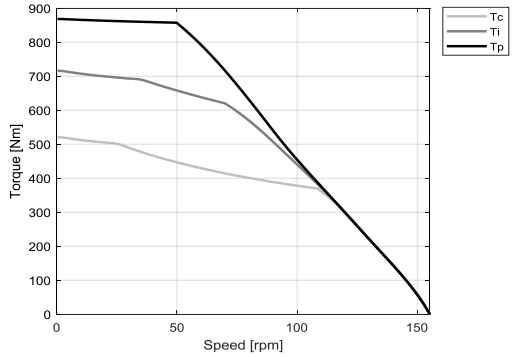

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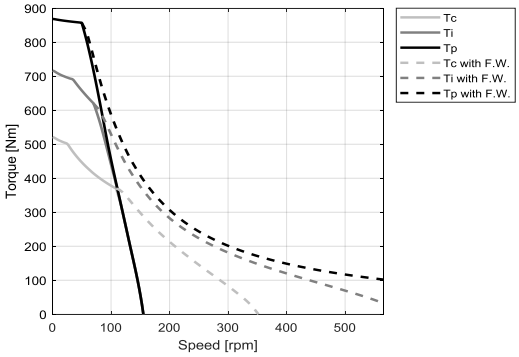

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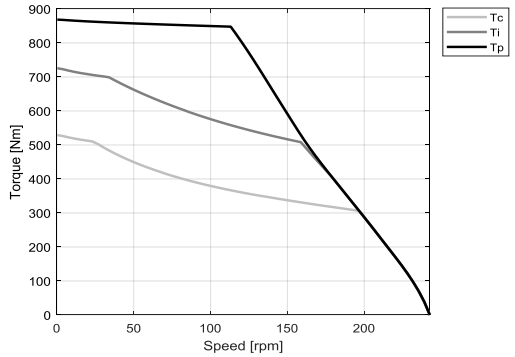

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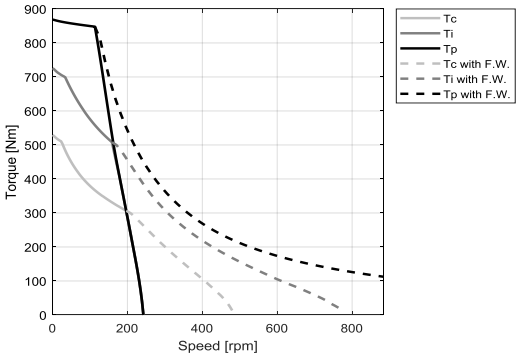

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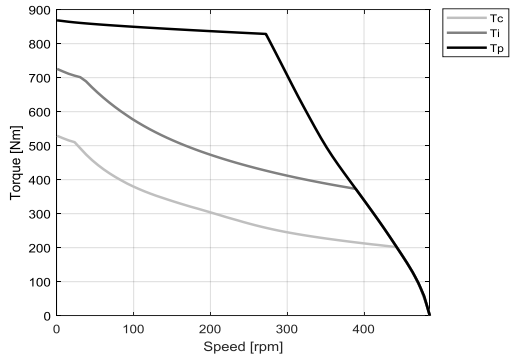

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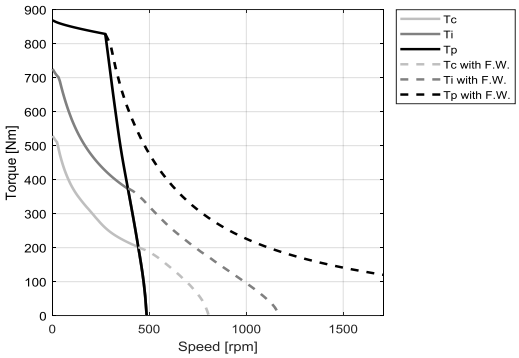

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0291-150

MOTOR PERFORMANCE		Winding codes	UA	SB	UB	UD
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	1220	1300	1300	1300
Ti	Intermittent torque	Nm	1040	1080	1090	1090
Tc	Continuous torque	Nm	795	783	795	795
Ts	Standstill torque	Nm	636	625	636	636
Ip	Peak current	Arms	20.1	28.9	45.1	90.2
Ii	Intermittent current	Arms	16.2	22.1	35.3	70.6
Ic	Continuous current	Arms	11.2	14.0	22.3	44.6
Is	Standstill current	Arms	8.45	10.6	16.9	33.8
ns	Rated low speed	rpm	0.31	0.31	0.31	0.31
nm	Maximum speed without flux weakening	rpm	80.8	103	162	324
nm,FW	Maximum speed with flux weakening	rpm	220	257	348	581
τon,p	Maximum ON time for peak cycle	s	19	13	14	14
τon,i	Maximum ON time for intermittent cycle	s	13	2.9	2.8	2.8
Pp	Power dissipation @ Ip	W	14400	18900	18400	18400
Pi	Power dissipation @ Ii	W	11600	14400	14600	14600
Pc	Power dissipation @ Ic	W	5860	5750	5860	5860
Td	Max. detent torque (average to peak)	Nm	5.6	5.6	5.6	5.6

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	85.7	67.0	42.9	21.4
Ku	Back EMF constant (*)	Vrms/(rad/s)	49.1	38.4	24.6	12.3
Km	Motor constant	Nm/√W	14.7	14.6	14.7	14.7
R20	Electrical resistance at 20°C (*)	Ohm	22.5	14.1	5.63	1.41
Ld/Lq	Electrical inductance (*)	mH	257 / 221	157 / 136	64.2 / 55.3	16.0 / 13.8
Isc	Maximum short-circuit current	Arms	10.0	12.8	20.1	40.1
nb	Base speed	rpm	25.3	56.6	120	284
nb,i	Base speed at intermittent duty cycle	rpm	0.00	11.5	86.6	242
nb,p	Base speed at peak duty cycle	rpm	0.00	10.7	60.4	171
nn	Rated speed	rpm	14.6	43.7	104	260
Tn	Rated torque	Nm	774	673	548	378
In	Rated current	Arms	11.1	12.0	14.7	19.9
τth	Thermal time constant	s	88.1	87.6	88.1	88.1
Rth	Thermal resistance	K/W	0.0167	0.0170	0.0167	0.0167
2p	Number of poles	-	44	44	44	44
J	Rotor inertia	kg·m²	0.121	0.121	0.121	0.121
mr	Rotor mass	kg	10.6	10.6	10.6	10.6
ms	Stator mass	kg	40.9	40.7	40.9	40.9

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.210	0.210	0.210	0.210
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	18	18	18	18
Δpw	Max. pressure drop at qw	bar	1.8	1.7	1.8	1.8

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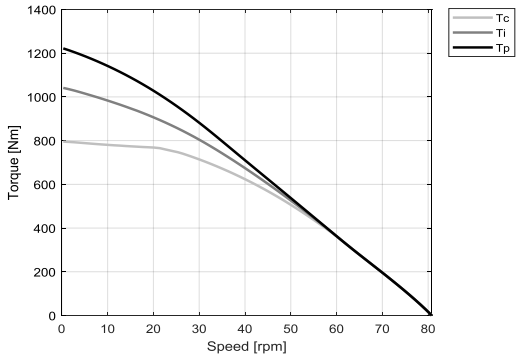
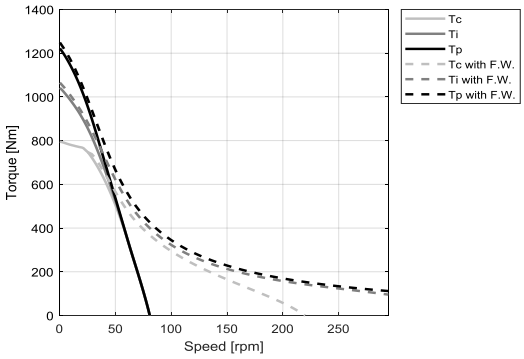
CONVENTIONAL TORQUE MOTOR TMB+0291-150

UA - WATER COOLING



UA - WATER COOLING



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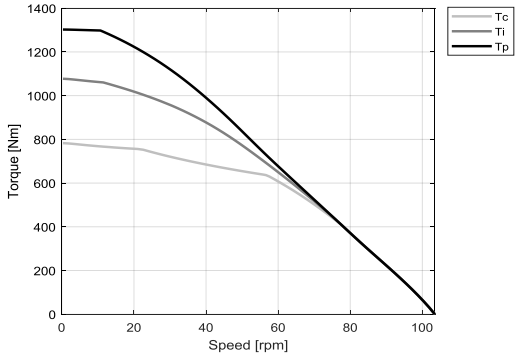

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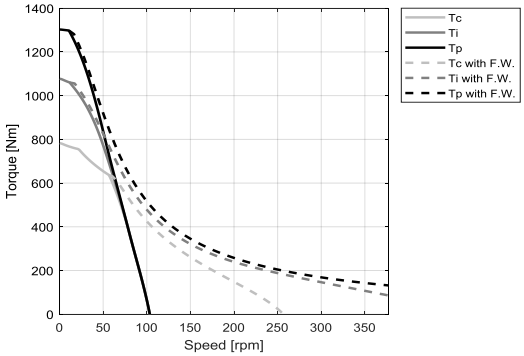

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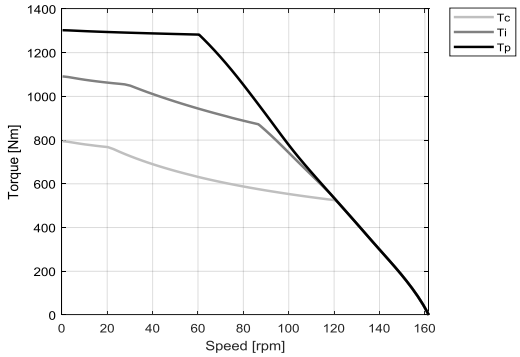

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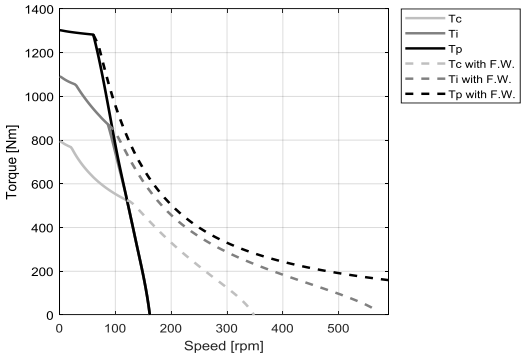

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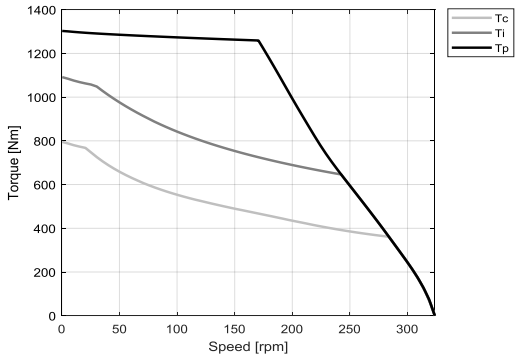
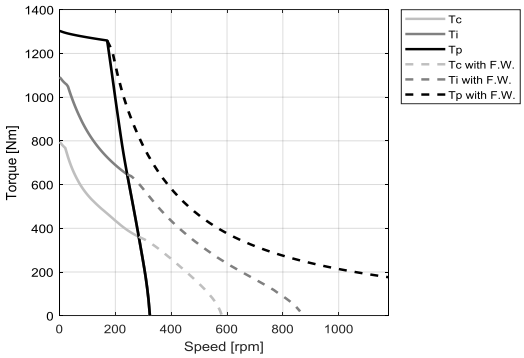


UD - WATER COOLING



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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0291-200

		Winding codes	SB	UB	SD	UD
MOTOR PERFORMANCE		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	1590	1740	1740	1740
Ti	Intermittent torque	Nm	1360	1450	1430	1450
Tc	Continuous torque	Nm	1040	1050	1040	1050
Ts	Standstill torque	Nm	825	840	825	840
Ip	Peak current	Arms	24.6	44.7	57.3	89.5
Ii	Intermittent current	Arms	20.0	34.8	43.6	69.6
Ic	Continuous current	Arms	13.8	22.0	27.6	44.0
Is	Standstill current	Arms	10.4	16.7	20.9	33.4
ns	Rated low speed	rpm	0.32	0.32	0.32	0.32
nm	Maximum speed without flux weakening	rpm	77.6	121	155	243
nm,FW	Maximum speed with flux weakening	rpm	203	275	327	458
τon,p	Maximum ON time for peak cycle	s	18	12	11	12
τon,i	Maximum ON time for intermittent cycle	s	12	2.8	2.8	2.8
Pp	Power dissipation @ Ip	W	17700	23600	24300	23600
Pi	Power dissipation @ Ii	W	14300	18400	18000	18400
Pc	Power dissipation @ Ic	W	7220	7350	7220	7350
Td	Max. detent torque (average to peak)	Nm	7.5	7.5	7.5	7.5
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	89.3	57.2	44.7	28.6
Ku	Back EMF constant (*)	Vrms/(rad/s)	51.2	32.7	25.6	16.4
Km	Motor constant	Nm/√W	17.0	17.2	17.0	17.2
R20	Electrical resistance at 20°C (*)	Ohm	18.5	7.37	4.61	1.84
Ld/Lq	Electrical inductance (*)	mH	208 / 182	85.3 / 73.8	52.1 / 45.4	21.3 / 18.5
Isc	Maximum short-circuit current	Arms	12.9	20.1	25.8	40.3
nb	Base speed	rpm	24.3	80.9	116	205
nb,i	Base speed at intermittent duty cycle	rpm	0.00	43.8	83.6	169
nb,p	Base speed at peak duty cycle	rpm	0.00	31.2	55.8	118
nn	Rated speed	rpm	14.2	67.6	99.9	184
Tn	Rated torque	Nm	1010	796	714	575
In	Rated current	Arms	13.7	16.2	18.3	22.6
τth	Thermal time constant	s	86.0	86.4	86.0	86.4
Rth	Thermal resistance	K/W	0.0128	0.0125	0.0128	0.0125
2p	Number of poles	-	44	44	44	44
J	Rotor inertia	kg·m²	0.161	0.161	0.161	0.161
mr	Rotor mass	kg	14.0	14.0	14.0	14.0
ms	Stator mass	kg	52.3	52.5	52.3	52.5
MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.275	0.275	0.275	0.275
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	23	23	23	23
Δpw	Max. pressure drop at qw	bar	3.3	3.3	3.3	3.3

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
Please refer to ETEL Integration Manual for the mass of the optional cooling jacket and the possible additional pressure drop.

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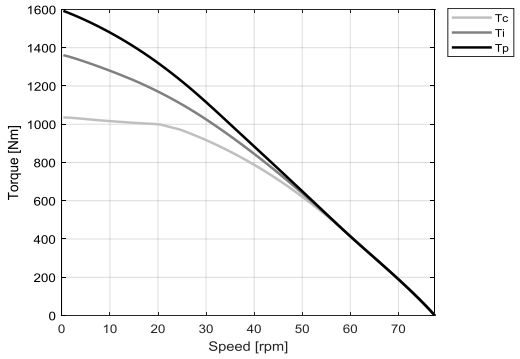
SB - WATER COOLING



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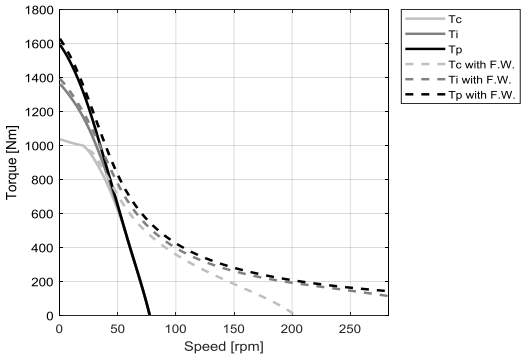
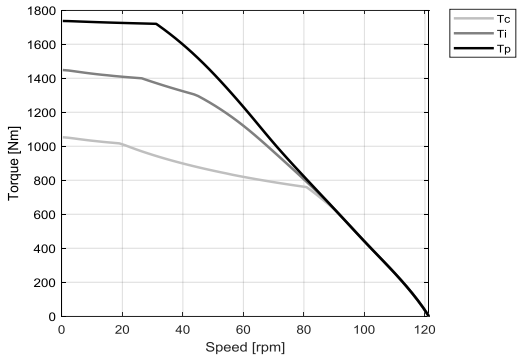


UB - WATER COOLING



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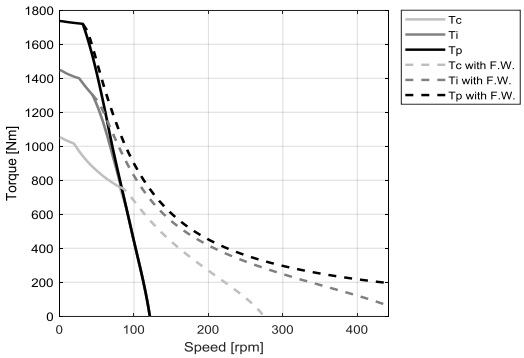
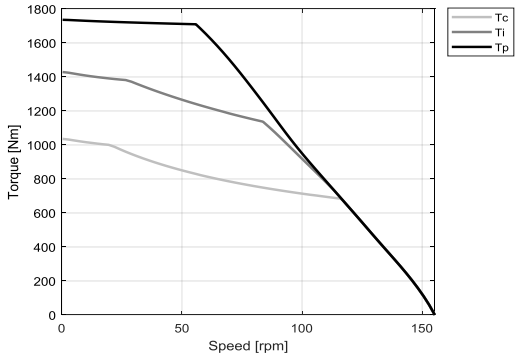


SD - WATER COOLING



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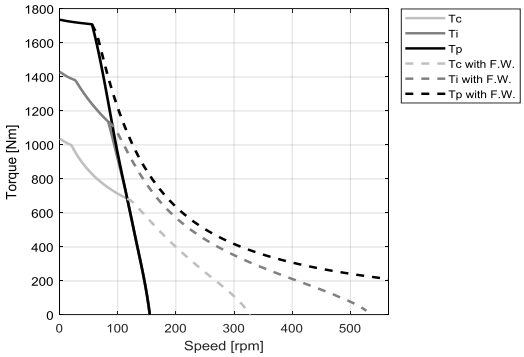
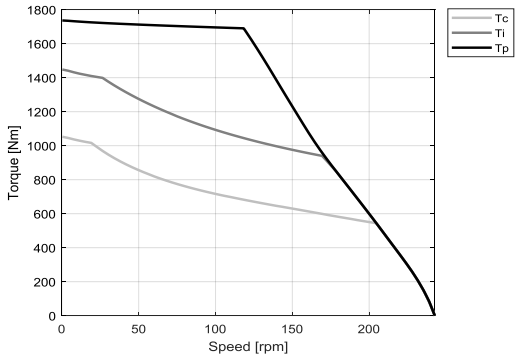


UD - WATER COOLING



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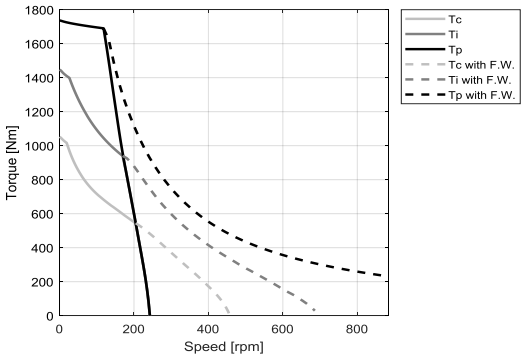

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0360-030

MOTOR PERFORMANCE		Winding codes	TA	VA	VB	TF
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	440	441	441	440
Ti	Intermittent torque	Nm	315	317	317	315
Tc	Continuous torque	Nm	231	230	230	231
Ts	Standstill torque	Nm	186	184	184	186
Ip	Peak current	Arms	25.3	40.1	80.3	152
Ii	Intermittent current	Arms	13.8	22.9	45.8	83.0
Ic	Continuous current	Arms	8.75	14.5	28.9	52.5
Is	Standstill current	Arms	6.63	11.0	21.9	39.8
ns	Rated low speed	rpm	0.19	0.20	0.20	0.19
nm	Maximum speed without flux weakening	rpm	211	358	716	1270
nm,FW	Maximum speed with flux weakening	rpm	760	952	1300	1300
τon,p	Maximum ON time for peak cycle	s	5.8	6.2	6.2	5.8
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	13300	11800	11800	13300
Pi	Power dissipation @ Ii	W	4950	4820	4820	4950
Pc	Power dissipation @ Ic	W	1980	1930	1930	1980
Td	Max. detent torque (average to peak)	Nm	1.2	1.2	1.2	1.2

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	32.6	19.2	9.61	5.44
Ku	Back EMF constant (*)	Vrms/(rad/s)	18.8	11.1	5.55	3.14
Km	Motor constant	Nm/√W	7.67	7.56	7.56	7.67
R20	Electrical resistance at 20°C (*)	Ohm	12.1	4.31	1.08	0.336
Ld/Lq	Electrical inductance (*)	mH	99.0 / 87.9	30.5 / 27.9	7.62 / 6.97	2.75 / 2.44
Isc	Maximum short-circuit current	Arms	6.65	12.7	25.5	39.9
nb	Base speed	rpm	119	260	612	N/A
nb,i	Base speed at intermittent duty cycle	rpm	83.5	197	492	964
nb,p	Base speed at peak duty cycle	rpm	48.7	148	349	599
nn	Rated speed	rpm	99.4	226	555	802
Tn	Rated torque	Nm	216	185	126	95.1
In	Rated current	Arms	8.54	11.7	15.7	21.5
τth	Thermal time constant	s	93.8	89.4	89.4	93.8
Rth	Thermal resistance	K/W	0.0537	0.0549	0.0549	0.0537
2p	Number of poles	-	66	66	66	66
J	Rotor inertia	kg·m²	0.0647	0.0647	0.0647	0.0647
mr	Rotor mass	kg	3.27	3.27	3.27	3.27
ms	Stator mass	kg	19.7	19.4	19.4	19.7

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.079	0.079	0.079	0.079
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	6.2	6.0	6.0	6.2
Δpw	Max. pressure drop at qw	bar	0.2	0.2	0.2	0.2

Notes: (*) terminal to terminal.
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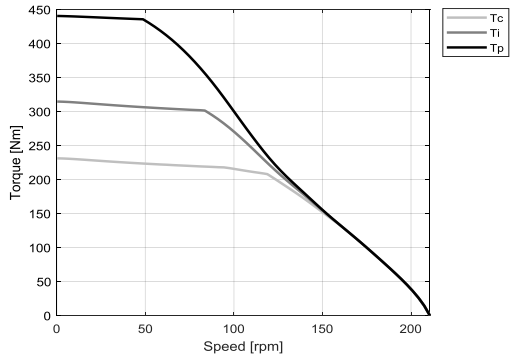
CONVENTIONAL TORQUE MOTOR TMB+0360-030

TA - WATER COOLING



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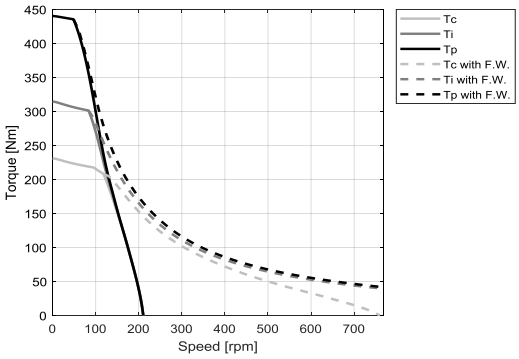
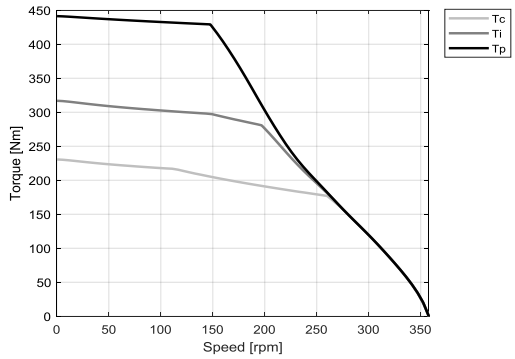


VA - WATER COOLING



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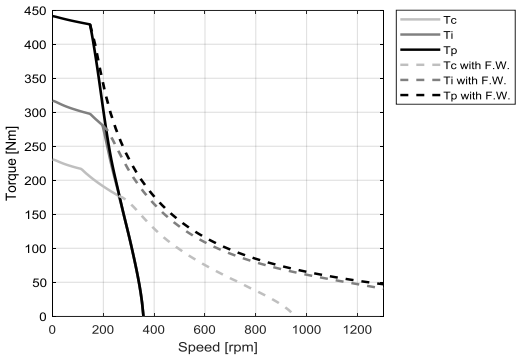

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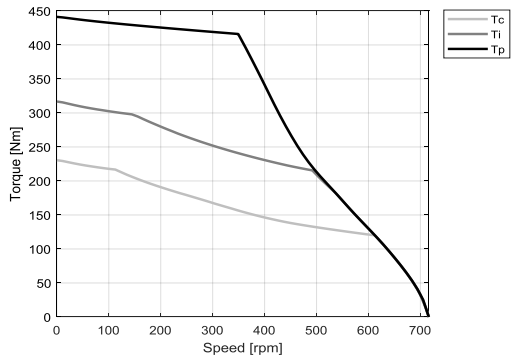

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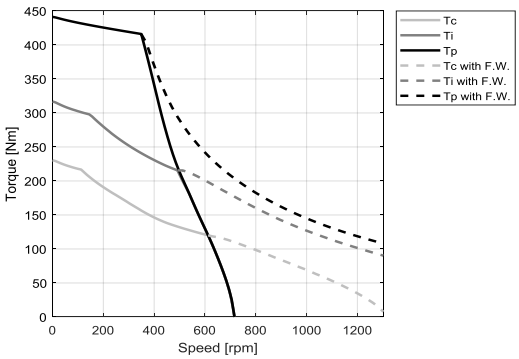
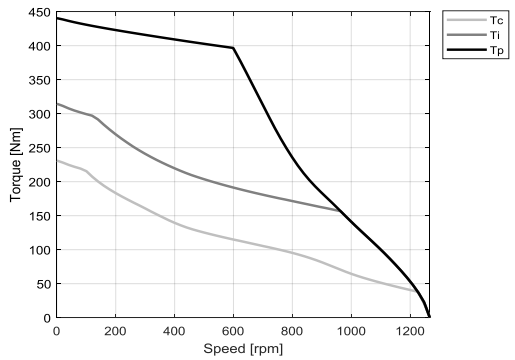


TF - WATER COOLING



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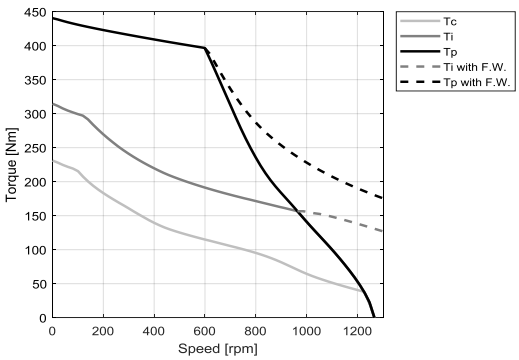

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0360-050

MOTOR PERFORMANCE		Winding codes	TA	VA	VB	TF
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	736	735	735	736
Ti	Intermittent torque	Nm	567	538	538	567
Tc	Continuous torque	Nm	415	390	390	415
Ts	Standstill torque	Nm	333	311	311	333
Ip	Peak current	Arms	22.5	40.4	80.9	135
Ii	Intermittent current	Arms	14.7	24.3	48.5	87.9
Ic	Continuous current	Arms	9.27	15.3	30.7	55.6
Is	Standstill current	Arms	7.02	11.6	23.3	42.1
ns	Rated low speed	rpm	0.21	0.22	0.22	0.21
nm	Maximum speed without flux weakening	rpm	126	226	453	756
nm,FW	Maximum speed with flux weakening	rpm	413	598	901	1150
τon,p	Maximum ON time for peak cycle	s	8.6	6.3	6.3	8.6
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.8	2.8	2.9
Pp	Power dissipation @ Ip	W	14100	16600	16600	14100
Pi	Power dissipation @ Ii	W	7740	7560	7560	7740
Pc	Power dissipation @ Ic	W	3100	3020	3020	3100
Td	Max. detent torque (average to peak)	Nm	2.0	2.0	2.0	2.0

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	54.7	30.4	15.2	9.11
Ku	Back EMF constant (*)	Vrms/(rad/s)	31.6	17.5	8.77	5.26
Km	Motor constant	Nm/√W	10.9	10.1	10.1	10.9
R20	Electrical resistance at 20°C (*)	Ohm	16.9	6.03	1.51	0.470
Ld/Lq	Electrical inductance (*)	mH	155 / 136	47.9 / 43.1	12.0 / 10.8	4.31 / 3.77
Isc	Maximum short-circuit current	Arms	7.12	12.8	25.6	42.7
nb	Base speed	rpm	59.2	156	381	701
nb,i	Base speed at intermittent duty cycle	rpm	31.3	110	303	577
nb,p	Base speed at peak duty cycle	rpm	16.6	75.4	206	377
nn	Rated speed	rpm	47.6	134	345	599
Tn	Rated torque	Nm	397	308	210	155
In	Rated current	Arms	9.19	12.1	16.1	20.3
τth	Thermal time constant	s	86.1	82.4	82.4	86.1
Rth	Thermal resistance	K/W	0.0339	0.0346	0.0346	0.0339
2p	Number of poles	-	66	66	66	66
J	Rotor inertia	kg·m²	0.108	0.108	0.108	0.108
mr	Rotor mass	kg	5.47	5.47	5.47	5.47
ms	Stator mass	kg	25.7	25.3	25.3	25.7

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.110	0.110	0.110	0.110
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	9.7	9.4	9.4	9.7
Δpw	Max. pressure drop at qw	bar	0.3	0.3	0.3	0.3

Notes: (*) terminal to terminal.
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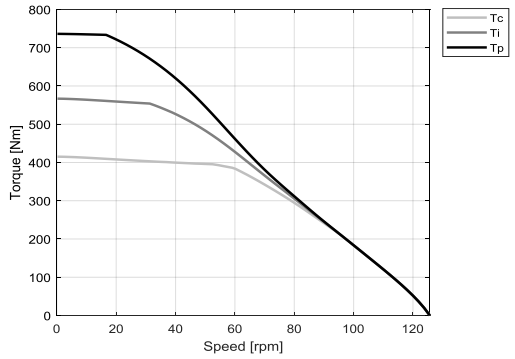
CONVENTIONAL TORQUE MOTOR TMB+0360-050

TA - WATER COOLING



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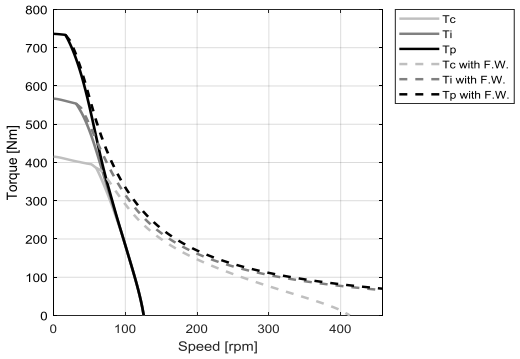
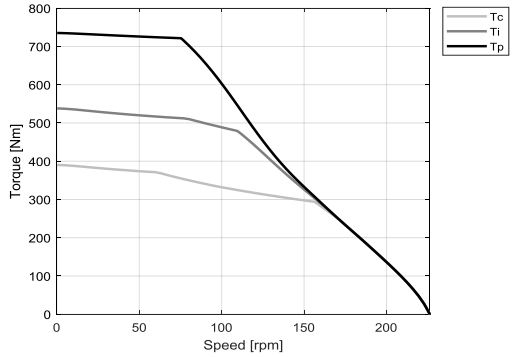
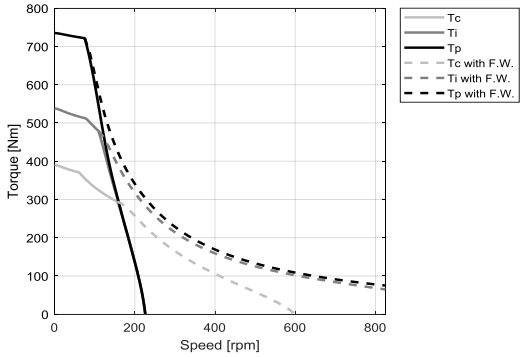


VA - WATER COOLING



VA - WATER COOLING



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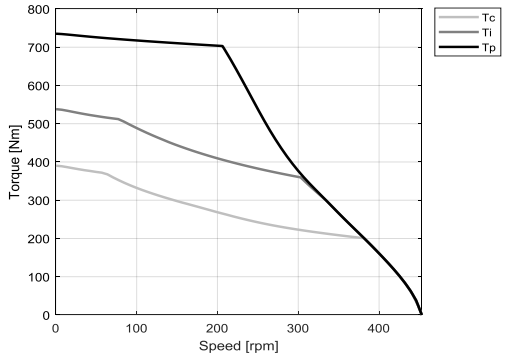

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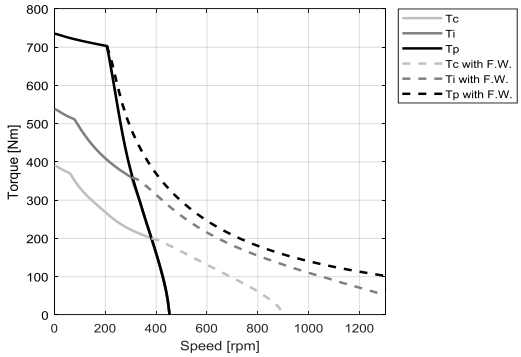
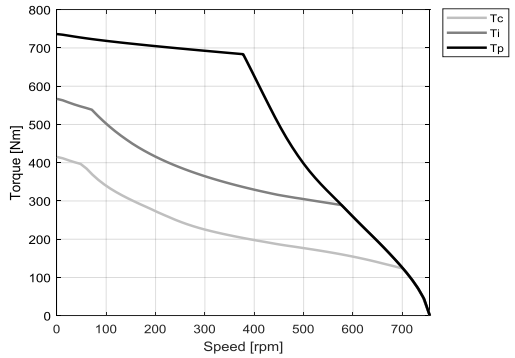
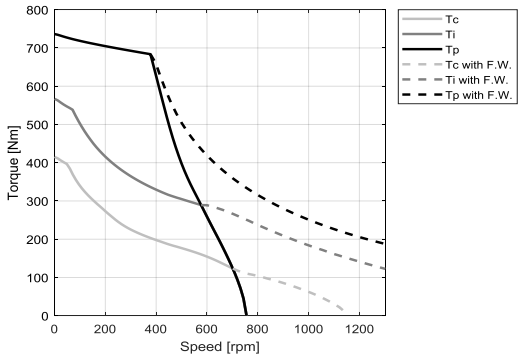


TF - WATER COOLING



TF - WATER COOLING



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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0360-070

MOTOR PERFORMANCE		Winding codes	TA	VA	VB	TF
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	990	1030	1030	1030
Ti	Intermittent torque	Nm	811	770	770	811
Tc	Continuous torque	Nm	596	560	560	596
Ts	Standstill torque	Nm	478	447	447	478
Ip	Peak current	Arms	20.3	39.7	79.4	132
Ii	Intermittent current	Arms	14.9	24.7	49.5	89.6
Ic	Continuous current	Arms	9.45	15.6	31.3	56.7
Is	Standstill current	Arms	7.16	11.9	23.7	42.9
ns	Rated low speed	rpm	0.21	0.22	0.22	0.21
nm	Maximum speed without flux weakening	rpm	89.7	162	323	540
nm,FW	Maximum speed with flux weakening	rpm	279	405	637	839
τon,p	Maximum ON time for peak cycle	s	11	6.5	6.5	9.0
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.8	2.8	2.9
Pp	Power dissipation @ Ip	W	14600	20400	20400	17400
Pi	Power dissipation @ Ii	W	10300	10100	10100	10300
Pc	Power dissipation @ Ic	W	4140	4040	4040	4140
Td	Max. detent torque (average to peak)	Nm	2.7	2.7	2.7	2.7

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	76.7	42.6	21.3	12.8
Ku	Back EMF constant (*)	Vrms/(rad/s)	44.2	24.6	12.3	7.37
Km	Motor constant	Nm/√W	13.4	12.5	12.5	13.4
R20	Electrical resistance at 20°C (*)	Ohm	21.8	7.77	1.94	0.606
Ld/Lq	Electrical inductance (*)	mH	207 / 180	63.7 / 57.2	15.9 / 14.3	5.74 / 5.01
Isc	Maximum short-circuit current	Arms	7.49	13.5	27.0	44.9
nb	Base speed	rpm	32.2	106	271	499
nb,i	Base speed at intermittent duty cycle	rpm	4.01	62.7	215	417
nb,p	Base speed at peak duty cycle	rpm	0.00	41.2	143	273
nn	Rated speed	rpm	24.6	89.2	244	432
Tn	Rated torque	Nm	580	453	306	225
In	Rated current	Arms	9.40	12.6	16.4	20.6
τth	Thermal time constant	s	84.9	81.5	81.5	84.9
Rth	Thermal resistance	K/W	0.0251	0.0256	0.0256	0.0251
2p	Number of poles	-	66	66	66	66
J	Rotor inertia	kg·m²	0.152	0.152	0.152	0.152
mr	Rotor mass	kg	7.66	7.66	7.66	7.66
ms	Stator mass	kg	32.2	31.7	31.7	32.2

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.150	0.150	0.150	0.150
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	13	13	13	13
Δpw	Max. pressure drop at qw	bar	0.5	0.5	0.5	0.5

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
Please refer to ETEL Integration Manual for the mass of the optional cooling jacket and the possible additional pressure drop.

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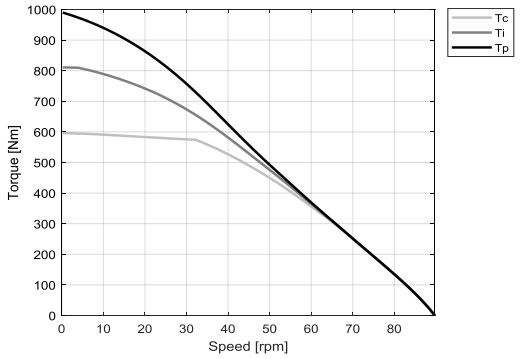
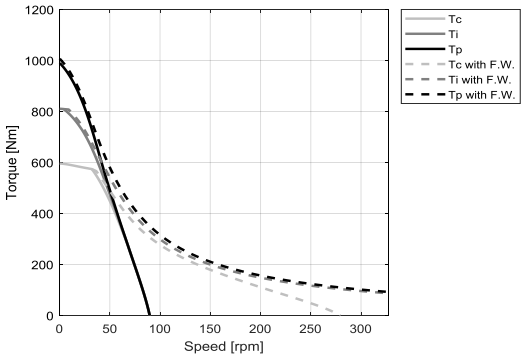
CONVENTIONAL TORQUE MOTOR TMB+0360-070

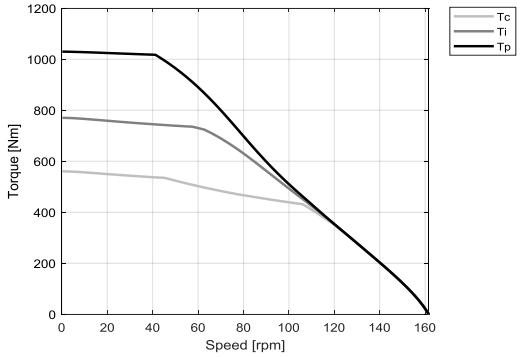
TA - WATER COOLING



TA - WATER COOLING



VA - WATER COOLING



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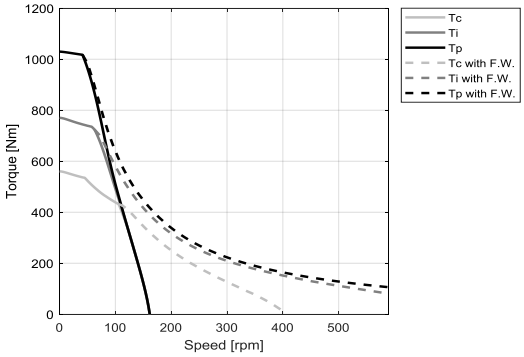
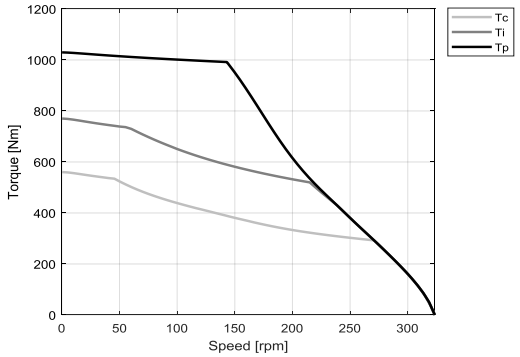


VB - WATER COOLING



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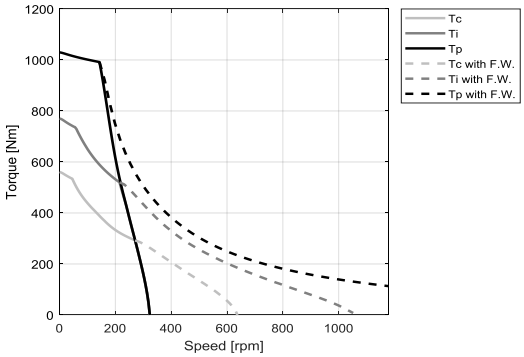
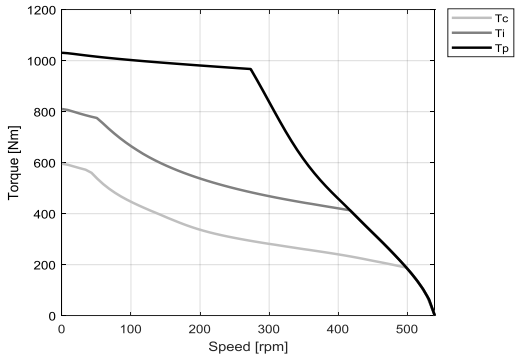


TF - WATER COOLING



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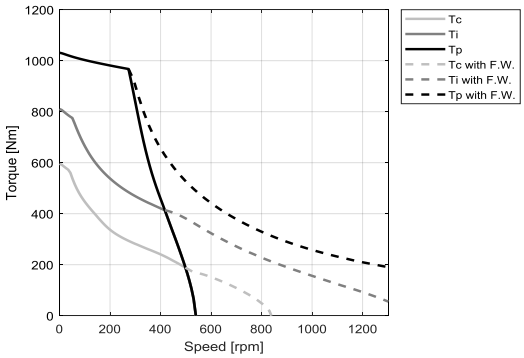

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0360-100

		Winding codes	UA	TB	VB	TF
MOTOR PERFORMANCE		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	1390	1470	1470	1470
Ti	Intermittent torque	Nm	1160	1180	1120	1180
Tc	Continuous torque	Nm	853	870	818	870
Ts	Standstill torque	Nm	684	699	653	699
Ip	Peak current	Arms	25.7	43.2	77.7	129
Ii	Intermittent current	Arms	19.7	30.4	50.4	91.2
Ic	Continuous current	Arms	12.5	19.2	31.9	57.7
Is	Standstill current	Arms	9.46	14.6	24.1	43.7
ns	Rated low speed	rpm	0.23	0.22	0.23	0.22
nm	Maximum speed without flux weakening	rpm	83.8	126	226	378
nm,FW	Maximum speed with flux weakening	rpm	234	311	468	666
τon,p	Maximum ON time for peak cycle	s	12	9.2	6.6	9.2
τon,i	Maximum ON time for intermittent cycle	s	3.1	2.8	2.8	2.8
Pp	Power dissipation @ Ip	W	18400	22300	26000	22300
Pi	Power dissipation @ Ii	W	14100	14300	13900	14300
Pc	Power dissipation @ Ic	W	5710	5720	5570	5720
Td	Max. detent torque (average to peak)	Nm	3.9	3.9	3.9	3.9

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	82.3	54.9	30.5	18.3
Ku	Back EMF constant (*)	Vrms/(rad/s)	47.3	31.6	17.5	10.5
Km	Motor constant	Nm/√W	16.1	16.6	15.4	16.6
R20	Electrical resistance at 20°C (*)	Ohm	17.4	7.33	2.61	0.814
Ld/Lq	Electrical inductance (*)	mH	158 / 139	70.3 / 61.2	21.7 / 19.4	7.81 / 6.80
Isc	Maximum short-circuit current	Arms	10.5	15.7	28.3	47.2
nb	Base speed	rpm	28.7	81.0	183	334
nb,i	Base speed at intermittent duty cycle	rpm	0.00	40.1	141	284
nb,p	Base speed at peak duty cycle	rpm	0.00	32.5	92.0	191
nn	Rated speed	rpm	21.4	67.4	162	307
Tn	Rated torque	Nm	831	690	492	382
In	Rated current	Arms	12.4	14.9	18.3	23.8
τth	Thermal time constant	s	79.6	81.0	77.9	81.0
Rth	Thermal resistance	K/W	0.0177	0.0177	0.0181	0.0177
2p	Number of poles	-	66	66	66	66
J	Rotor inertia	kg·m²	0.215	0.215	0.215	0.215
mr	Rotor mass	kg	10.9	10.9	10.9	10.9
ms	Stator mass	kg	40.6	40.9	40.3	40.9

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.200	0.200	0.200	0.200
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	18	18	17	18
Δpw	Max. pressure drop at qw	bar	1.1	1.1	1.0	1.1

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
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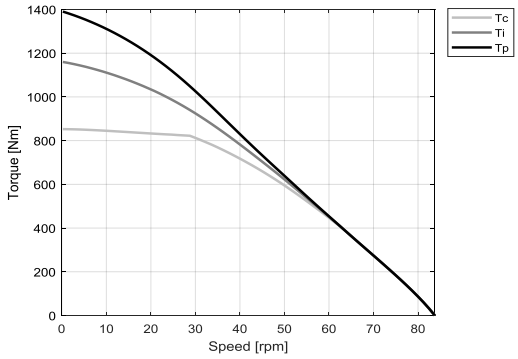
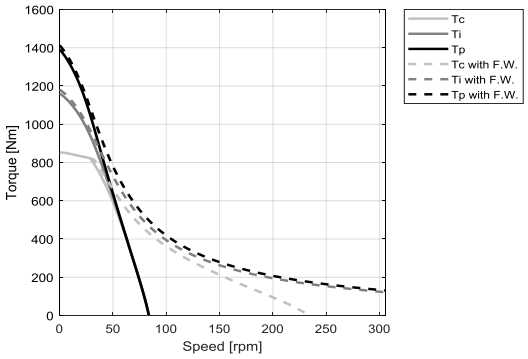
CONVENTIONAL TORQUE MOTOR TMB+0360-100

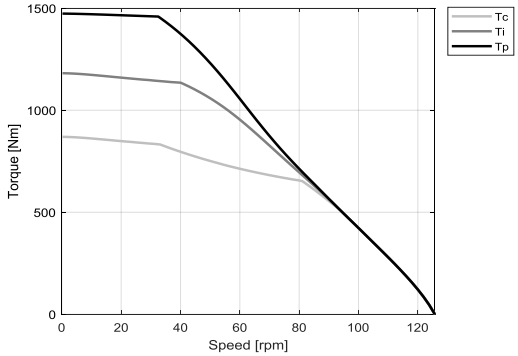
UA - WATER COOLING



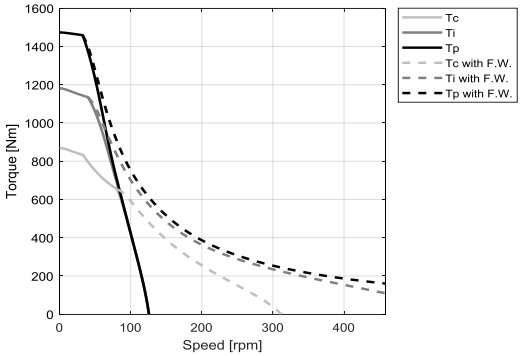
UA - WATER COOLING



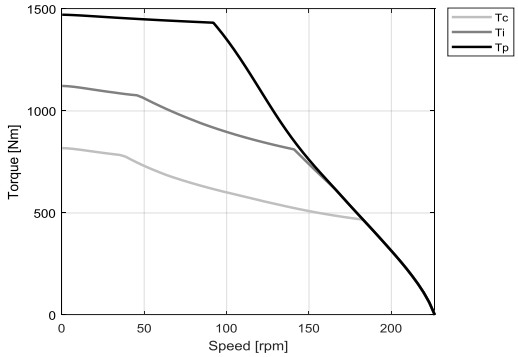
TB - WATER COOLING



TB - WATER COOLING



VB - WATER COOLING



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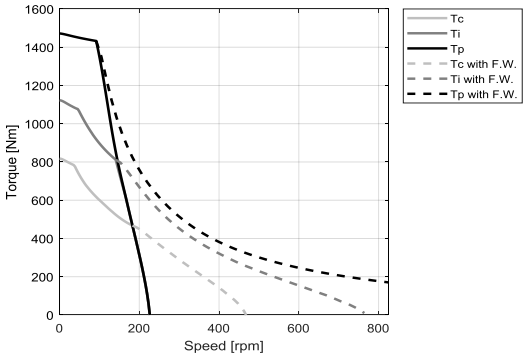

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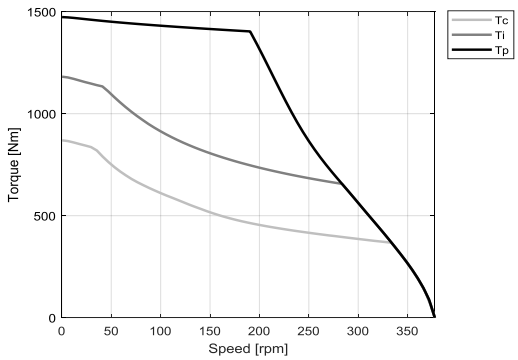

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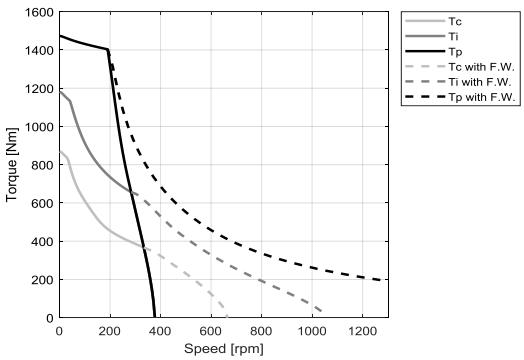

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0360-150

MOTOR PERFORMANCE		Winding codes	TB	VB	TF	UF
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	2200	2210	2210	2210
Ti	Intermittent torque	Nm	1770	1680	1770	1740
Tc	Continuous torque	Nm	1300	1220	1300	1280
Ts	Standstill torque	Nm	1050	976	1050	1020
Ip	Peak current	Arms	42.1	76.4	127	170
Ii	Intermittent current	Arms	30.1	49.8	90.3	117
Ic	Continuous current	Arms	19.0	31.5	57.1	74.1
Is	Standstill current	Arms	14.4	23.9	43.3	56.2
ns	Rated low speed	rpm	0.22	0.23	0.22	0.22
nm	Maximum speed without flux weakening	rpm	83.8	151	252	336
nm,FW	Maximum speed with flux weakening	rpm	222	335	480	582
τon,p	Maximum ON time for peak cycle	s	8.6	5.8	8.3	7.3
τon,i	Maximum ON time for intermittent cycle	s	2.8	2.8	2.8	2.8
Pp	Power dissipation @ Ip	W	30200	36000	30800	32600
Pi	Power dissipation @ Ii	W	19900	19300	19900	19800
Pc	Power dissipation @ Ic	W	7960	7720	7960	7930
Td	Max. detent torque (average to peak)	Nm	5.9	5.9	5.9	5.9

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	82.4	45.8	27.5	20.6
Ku	Back EMF constant (*)	Vrms/(rad/s)	47.3	26.3	15.8	11.8
Km	Motor constant	Nm/√W	20.7	19.3	20.7	20.2
R20	Electrical resistance at 20°C (*)	Ohm	10.5	3.75	1.17	0.693
Ld/Lq	Electrical inductance (*)	mH	105 / 91.6	32.3 / 29.0	11.6 / 10.2	6.54 / 5.78
Isc	Maximum short-circuit current	Arms	15.8	28.5	47.5	63.3
nb	Base speed	rpm	36.3	110	214	296
nb,i	Base speed at intermittent duty cycle	rpm	7.71	74.9	174	252
nb,p	Base speed at peak duty cycle	rpm	0.00	45.3	118	166
nn	Rated speed	rpm	25.3	93.4	194	272
Tn	Rated torque	Nm	1260	886	659	573
In	Rated current	Arms	18.9	22.2	27.0	31.5
τth	Thermal time constant	s	82.4	79.5	82.4	81.1
Rth	Thermal resistance	K/W	0.0122	0.0124	0.0122	0.0122
2p	Number of poles	-	66	66	66	66
J	Rotor inertia	kg·m²	0.323	0.323	0.323	0.323
mr	Rotor mass	kg	16.3	16.3	16.3	16.3
ms	Stator mass	kg	57.3	56.4	57.3	57.0

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.280	0.280	0.280	0.280
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	25	24	25	25
Δpw	Max. pressure drop at qw	bar	2.1	2.0	2.1	2.1

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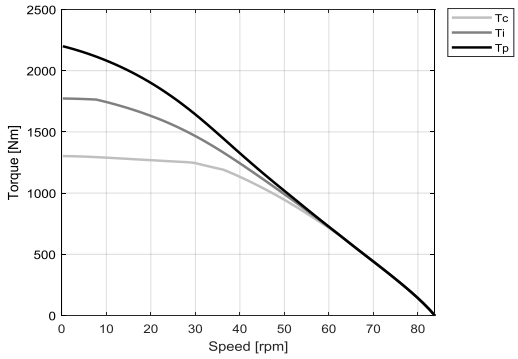
TB - WATER COOLING



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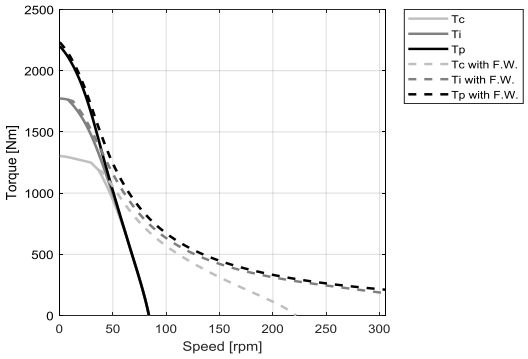

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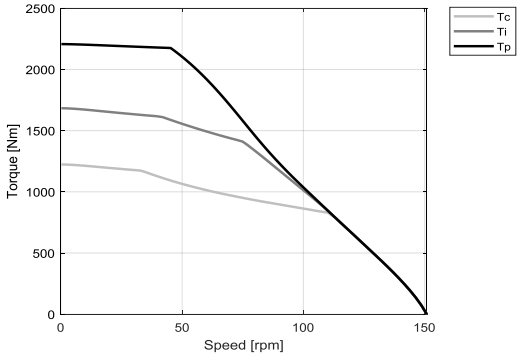

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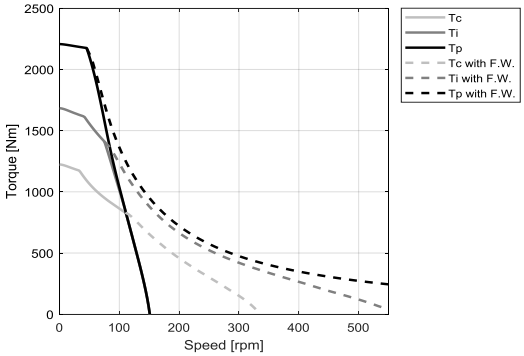

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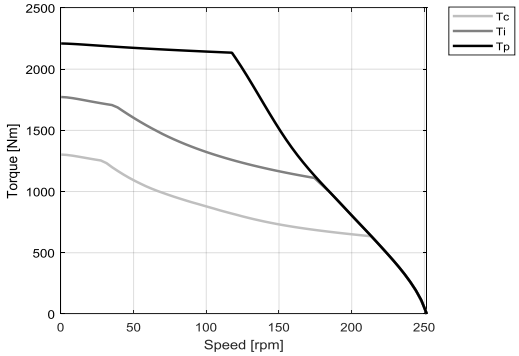
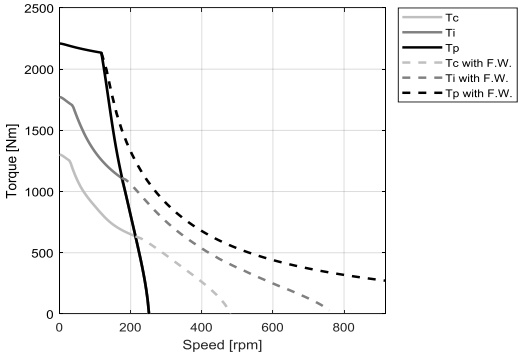


TF - WATER COOLING



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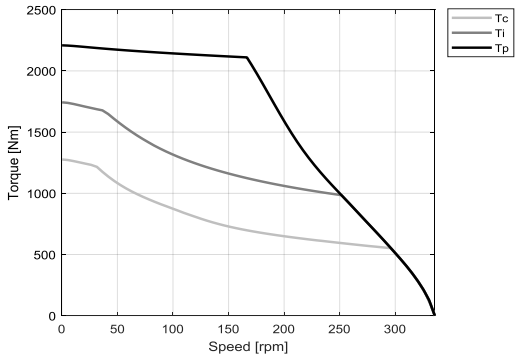

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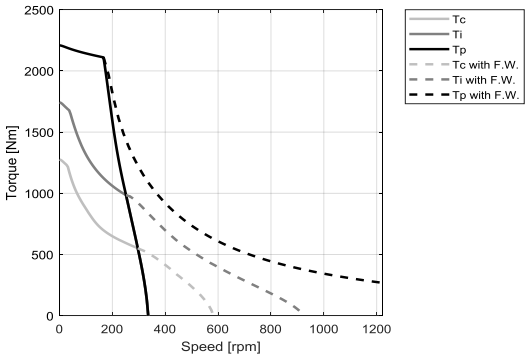

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0360-200

MOTOR PERFORMANCE		Winding codes	UB	VB	TF	UF
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	2890	2940	2950	2940
Ti	Intermittent torque	Nm	2310	2220	2350	2310
Tc	Continuous torque	Nm	1680	1610	1720	1680
Ts	Standstill torque	Nm	1350	1280	1380	1350
Ip	Peak current	Arms	54.1	75.8	126	168
Ii	Intermittent current	Arms	38.4	48.8	88.8	115
Ic	Continuous current	Arms	24.3	30.9	56.1	72.8
Is	Standstill current	Arms	18.4	23.4	42.5	55.1
ns	Rated low speed	rpm	0.23	0.23	0.22	0.23
nm	Maximum speed without flux weakening	rpm	83.8	113	189	252
nm,FW	Maximum speed with flux weakening	rpm	212	262	380	459
τon,p	Maximum ON time for peak cycle	s	6.8	4.8	6.9	6.0
τon,i	Maximum ON time for intermittent cycle	s	2.7	2.7	2.8	2.7
Pp	Power dissipation @ Ip	W	38900	46400	39800	42100
Pi	Power dissipation @ Ii	W	24700	23900	24800	24700
Pc	Power dissipation @ Ic	W	9870	9570	9930	9870
Td	Max. detent torque (average to peak)	Nm	7.8	7.8	7.8	7.8

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	82.5	61.1	36.7	27.5
Ku	Back EMF constant (*)	Vrms/(rad/s)	47.3	35.1	21.0	15.8
Km	Motor constant	Nm/√W	23.5	22.5	24.2	23.5
R20	Electrical resistance at 20°C (*)	Ohm	8.20	4.92	1.54	0.911
Ld/Lq	Electrical inductance (*)	mH	78.2 / 69.5	42.9 / 38.8	15.5 / 13.6	8.69 / 7.72
Isc	Maximum short-circuit current	Arms	21.2	28.6	47.6	63.5
nb	Base speed	rpm	38.2	71.7	154	215
nb,i	Base speed at intermittent duty cycle	rpm	9.71	33.9	120	178
nb,p	Base speed at peak duty cycle	rpm	0.00	17.5	79.6	117
nn	Rated speed	rpm	26.5	58.4	138	196
Tn	Rated torque	Nm	1620	1330	971	841
In	Rated current	Arms	24.1	25.3	29.7	34.3
τth	Thermal time constant	s	80.4	78.9	81.7	80.4
Rth	Thermal resistance	K/W	0.00916	0.00935	0.00919	0.00916
2p	Number of poles	-	66	66	66	66
J	Rotor inertia	kg·m²	0.434	0.434	0.434	0.434
mr	Rotor mass	kg	21.9	21.9	21.9	21.9
ms	Stator mass	kg	72.6	71.9	73.0	72.6

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.360	0.360	0.360	0.360
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	31	30	31	31
Δpw	Max. pressure drop at qw	bar	3.8	3.6	3.8	3.8

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
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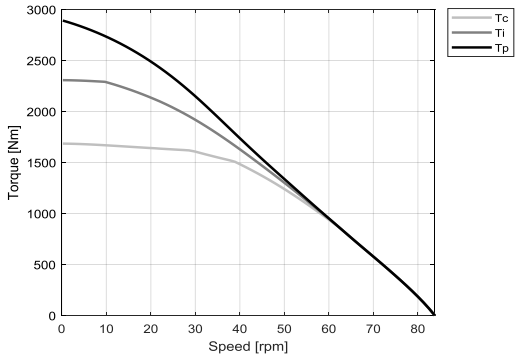
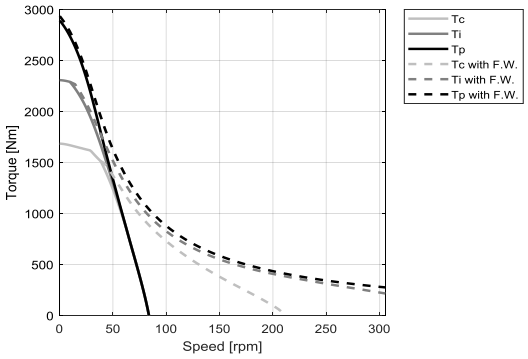
CONVENTIONAL TORQUE MOTOR TMB+0360-200

UB - WATER COOLING



UB - WATER COOLING



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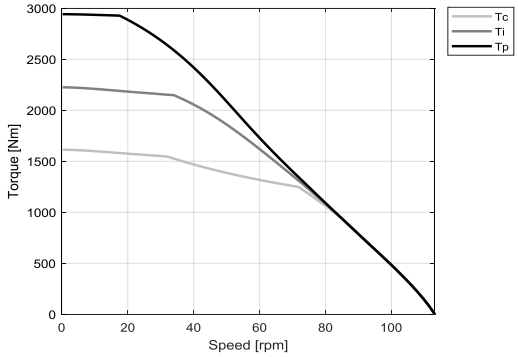

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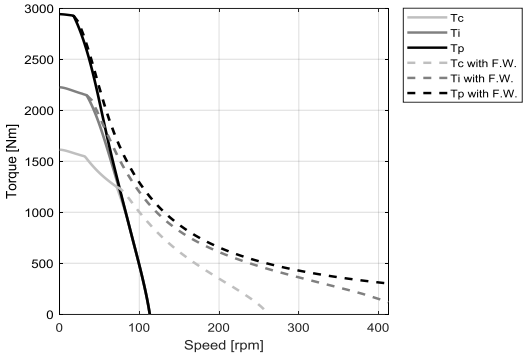
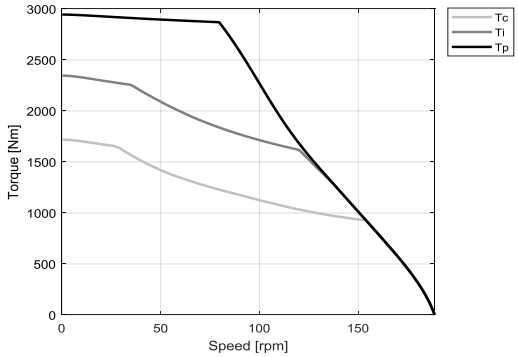


TF - WATER COOLING



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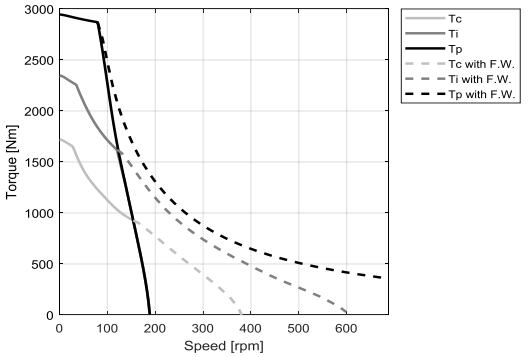

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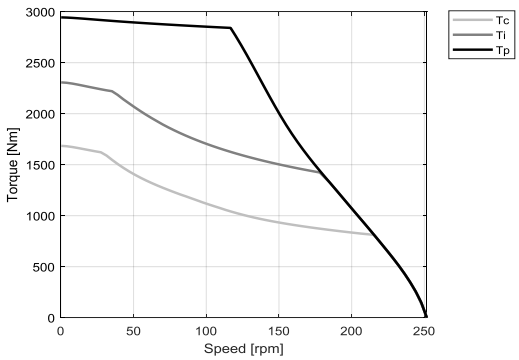

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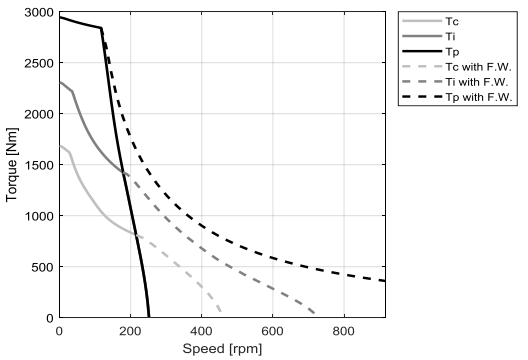

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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+0450-030

MOTOR PERFORMANCE		Winding codes	VA	WB	WD	WH
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	719	718	718	718
Ti	Intermittent torque	Nm	496	486	486	486
Tc	Continuous torque	Nm	375	366	366	366
Ts	Standstill torque	Nm	307	298	298	298
Ip	Peak current	Arms	43.8	117	235	469
Ii	Intermittent current	Arms	19.0	48.9	97.8	196
Ic	Continuous current	Arms	12.0	30.9	61.9	124
Is	Standstill current	Arms	9.11	23.4	46.9	93.7
ns	Rated low speed	rpm	0.10	0.10	0.10	0.10
nm	Maximum speed without flux weakening	rpm	167	448	897	1010
nm,FW	Maximum speed with flux weakening	rpm	610	973	1010	1010
τon,p	Maximum ON time for peak cycle	s	3.0	2.4	2.4	2.4
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	28800	31300	31300	31300
Pi	Power dissipation @ Ii	W	6150	6080	6080	6080
Pc	Power dissipation @ Ic	W	2460	2430	2430	2430
Td	Max. detent torque (average to peak)	Nm	2.0	2.0	2.0	2.0

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	41.1	15.4	7.68	3.84
Ku	Back EMF constant (*)	Vrms/(rad/s)	23.7	8.86	4.43	2.22
Km	Motor constant	Nm/√W	11.9	11.5	11.5	11.5
R20	Electrical resistance at 20°C (*)	Ohm	7.96	1.19	0.297	0.0743
Ld/Lq	Electrical inductance (*)	mH	77.6 / 63.8	10.8 / 9.08	2.71 / 2.27	0.678 / 0.567
Isc	Maximum short-circuit current	Arms	8.02	21.4	42.9	85.8
nb	Base speed	rpm	97.1	358	856	N/A
nb,i	Base speed at intermittent duty cycle	rpm	70.7	277	656	N/A
nb,p	Base speed at peak duty cycle	rpm	16.9	171	387	879
nn	Rated speed	rpm	82.1	318	592	590
Tn	Rated torque	Nm	344	218	153	153
In	Rated current	Arms	11.4	17.4	24.9	49.9
τth	Thermal time constant	s	135	132	132	132
Rth	Thermal resistance	K/W	0.0433	0.0438	0.0438	0.0438
2p	Number of poles	-	88	88	88	88
J	Rotor inertia	kg·m²	0.160	0.160	0.160	0.160
mr	Rotor mass	kg	4.83	4.83	4.83	4.83
ms	Stator mass	kg	31.1	31.0	31.0	31.0

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.110	0.110	0.110	0.110
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	7.7	7.6	7.6	7.6
Δpw	Max. pressure drop at qw	bar	0.2	0.2	0.2	0.2

Notes: (*) terminal to terminal.
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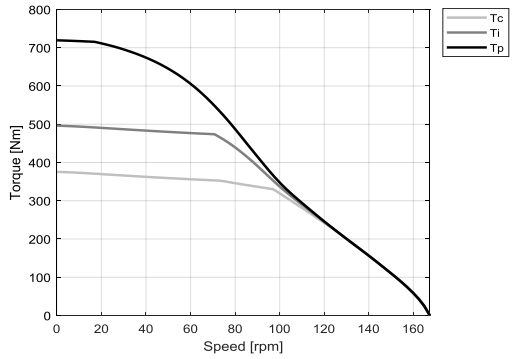
CONVENTIONAL TORQUE MOTOR TMB+0450-030

VA - WATER COOLING



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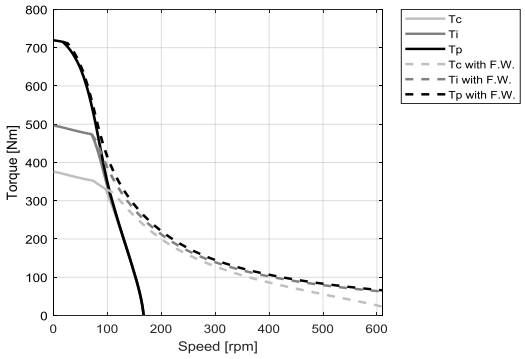
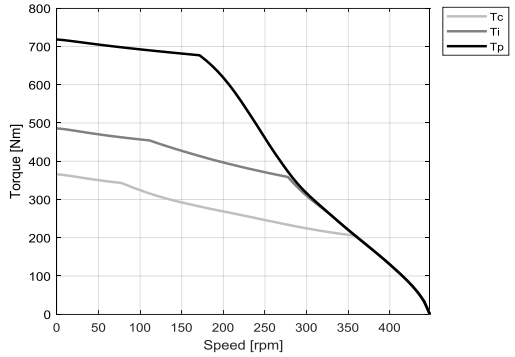


WB - WATER COOLING



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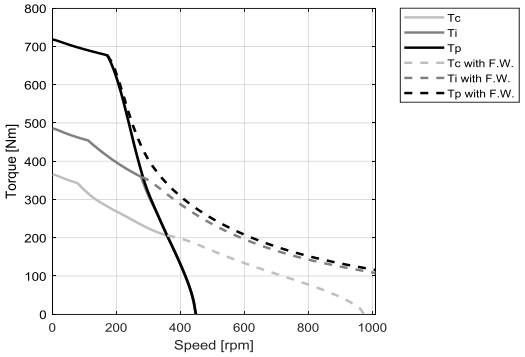

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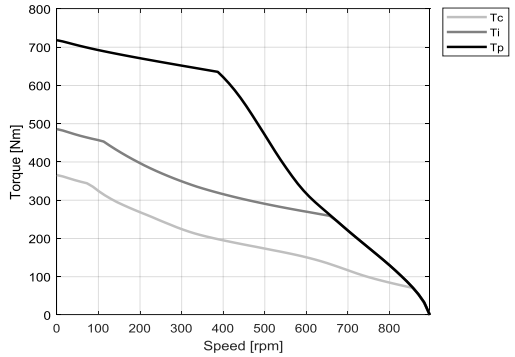

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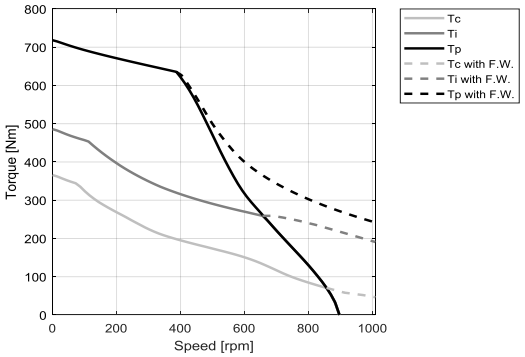

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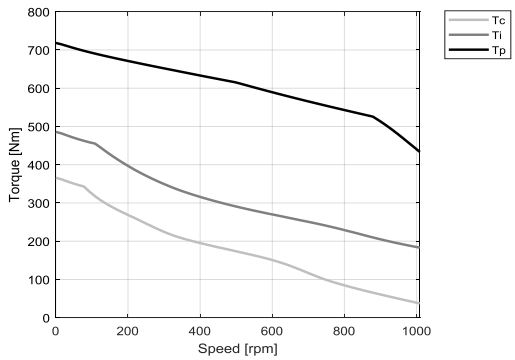

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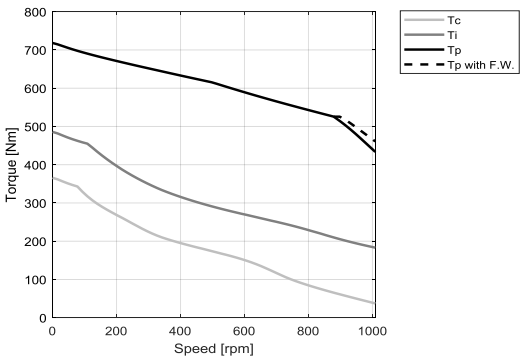

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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+0450-050

MOTOR PERFORMANCE		Winding codes	VA	WB	WD	WH
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	1210	1210	1210	1210
Ti	Intermittent torque	Nm	890	871	871	871
Tc	Continuous torque	Nm	672	655	655	655
Ts	Standstill torque	Nm	549	533	533	533
Ip	Peak current	Arms	37.2	99.4	199	398
Ii	Intermittent current	Arms	20.2	51.9	104	208
Ic	Continuous current	Arms	12.8	32.8	65.7	131
Is	Standstill current	Arms	9.67	24.9	49.8	99.5
ns	Rated low speed	rpm	0.11	0.11	0.11	0.11
nm	Maximum speed without flux weakening	rpm	100	268	536	963
nm,FW	Maximum speed with flux weakening	rpm	360	632	847	963
τon,p	Maximum ON time for peak cycle	s	6.4	5.4	5.4	5.4
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	26600	28700	28700	28700
Pi	Power dissipation @ Ii	W	9690	9560	9560	9560
Pc	Power dissipation @ Ic	W	3880	3830	3830	3830
Td	Max. detent torque (average to peak)	Nm	3.3	3.3	3.3	3.3

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	68.8	25.7	12.9	6.43
Ku	Back EMF constant (*)	Vrms/(rad/s)	39.7	14.8	7.42	3.71
Km	Motor constant	Nm/√W	16.8	16.3	16.3	16.3
R20	Electrical resistance at 20°C (*)	Ohm	11.1	1.66	0.416	0.104
Ld/Lq	Electrical inductance (*)	mH	122 / 98.8	17.1 / 14.1	4.26 / 3.51	1.07 / 0.878
Isc	Maximum short-circuit current	Arms	8.54	22.8	45.7	91.3
nb	Base speed	rpm	49.9	213	486	N/A
nb,i	Base speed at intermittent duty cycle	rpm	29.9	165	396	933
nb,p	Base speed at peak duty cycle	rpm	0.974	107	248	528
nn	Rated speed	rpm	40.3	189	438	437
Tn	Rated torque	Nm	641	390	251	252
In	Rated current	Arms	12.6	18.0	23.4	46.9
τth	Thermal time constant	s	122	120	120	120
Rth	Thermal resistance	K/W	0.0272	0.0275	0.0275	0.0275
2p	Number of poles	-	88	88	88	88
J	Rotor inertia	kg·m²	0.268	0.268	0.268	0.268
mr	Rotor mass	kg	8.11	8.11	8.11	8.11
ms	Stator mass	kg	40.3	40.0	40.0	40.0

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.150	0.150	0.150	0.150
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	12	12	12	12
Δpw	Max. pressure drop at qw	bar	0.4	0.4	0.4	0.4

Notes: (*) terminal to terminal.
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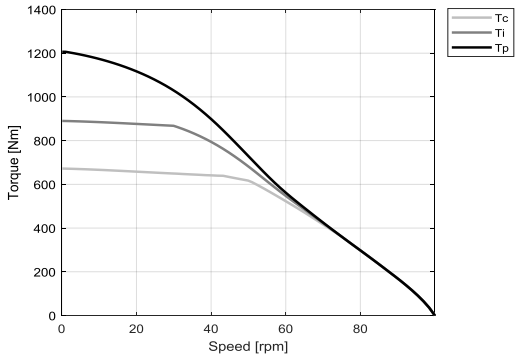
CONVENTIONAL TORQUE MOTOR TMB+0450-050

VA - WATER COOLING



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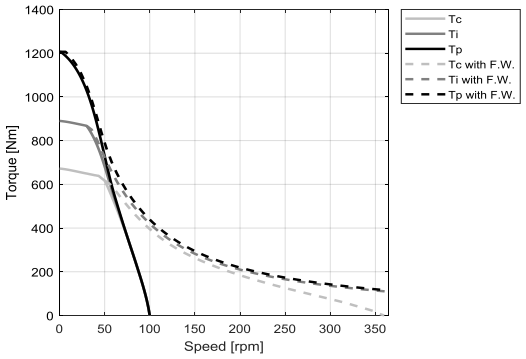
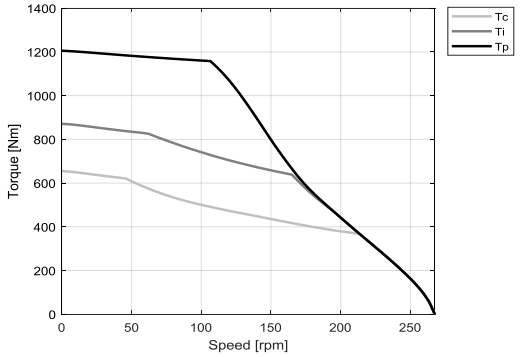


WB - WATER COOLING



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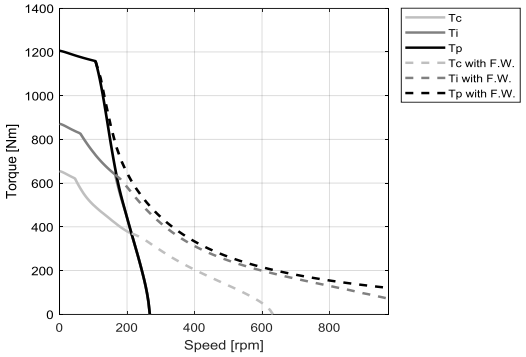

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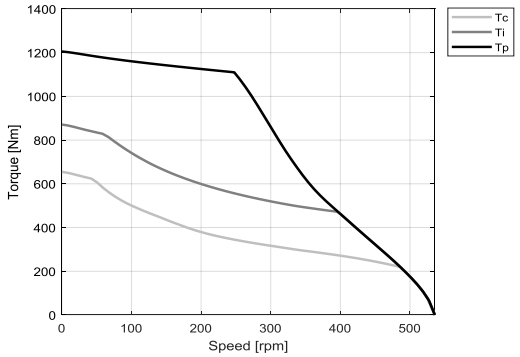

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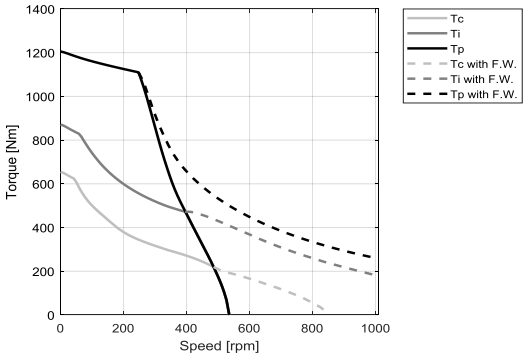

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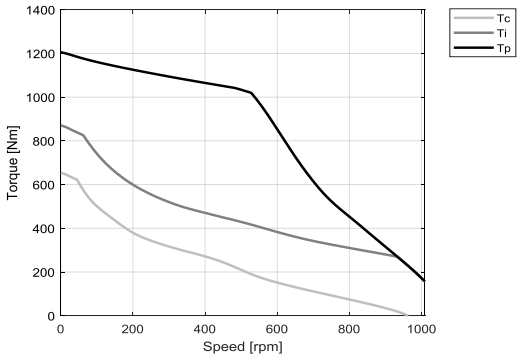
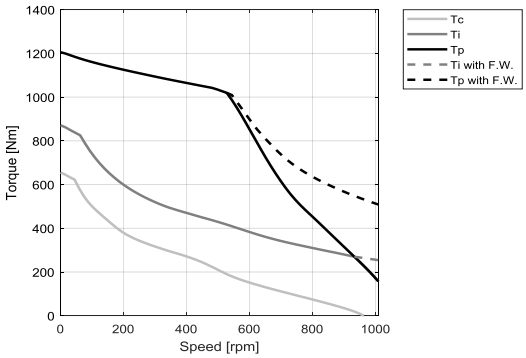


WH - WATER COOLING



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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0450-070

MOTOR PERFORMANCE		Winding codes	VA	WB	WD	WH
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	1590	1690	1690	1690
Ti	Intermittent torque	Nm	1270	1250	1250	1250
Tc	Continuous torque	Nm	964	939	939	939
Ts	Standstill torque	Nm	788	765	765	765
Ip	Peak current	Arms	30.4	95.8	192	383
Ii	Intermittent current	Arms	20.6	52.9	106	212
Ic	Continuous current	Arms	13.0	33.5	67.0	134
Is	Standstill current	Arms	9.86	25.4	50.7	101
ns	Rated low speed	rpm	0.11	0.12	0.12	0.12
nm	Maximum speed without flux weakening	rpm	71.4	191	383	767
nm,FW	Maximum speed with flux weakening	rpm	239	438	619	767
τon,p	Maximum ON time for peak cycle	s	12	6.0	6.0	6.0
τon,i	Maximum ON time for intermittent cycle	s	2.8	2.8	2.8	2.8
Pp	Power dissipation @ Ip	W	21900	33800	33800	33800
Pi	Power dissipation @ Ii	W	13000	12800	12800	12800
Pc	Power dissipation @ Ic	W	5180	5110	5110	5110
Td	Max. detent torque (average to peak)	Nm	4.6	4.6	4.6	4.6

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	96.5	36.1	18.0	9.02
Ku	Back EMF constant (*)	Vrms/(rad/s)	55.6	20.8	10.4	5.19
Km	Motor constant	Nm/√W	20.8	20.1	20.1	20.1
R20	Electrical resistance at 20°C (*)	Ohm	14.4	2.14	0.536	0.134
Ld/Lq	Electrical inductance (*)	mH	163 / 131	22.7 / 18.7	5.69 / 4.67	1.42 / 1.17
Isc	Maximum short-circuit current	Arms	8.96	24.0	47.9	95.9
nb	Base speed	rpm	28.4	152	346	N/A
nb,i	Base speed at intermittent duty cycle	rpm	9.79	116	287	663
nb,p	Base speed at peak duty cycle	rpm	0.00	71.6	179	387
nn	Rated speed	rpm	22.7	134	317	319
Tn	Rated torque	Nm	935	566	365	362
In	Rated current	Arms	12.9	18.4	23.7	47.0
τth	Thermal time constant	s	120	118	118	118
Rth	Thermal resistance	K/W	0.0202	0.0204	0.0204	0.0204
2p	Number of poles	-	88	88	88	88
J	Rotor inertia	kg·m²	0.377	0.377	0.377	0.377
mr	Rotor mass	kg	11.4	11.4	11.4	11.4
ms	Stator mass	kg	50.1	49.8	49.8	49.8

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.200	0.200	0.200	0.200
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	16	16	16	16
Δpw	Max. pressure drop at qw	bar	0.7	0.7	0.7	0.7

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
Please refer to ETEL Integration Manual for the mass of the optional cooling jacket and the possible additional pressure drop.

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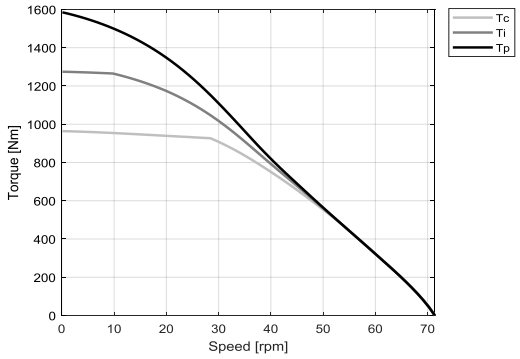
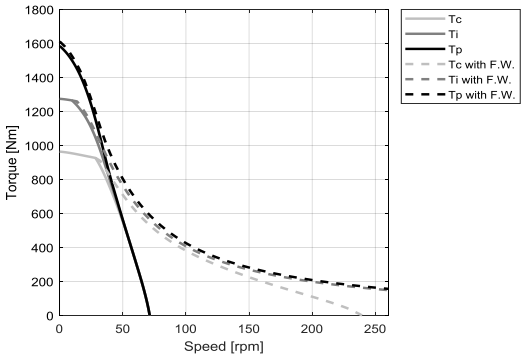
CONVENTIONAL TORQUE MOTOR TMB+0450-070

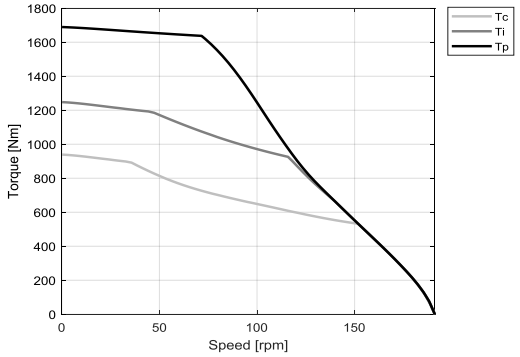
VA - WATER COOLING



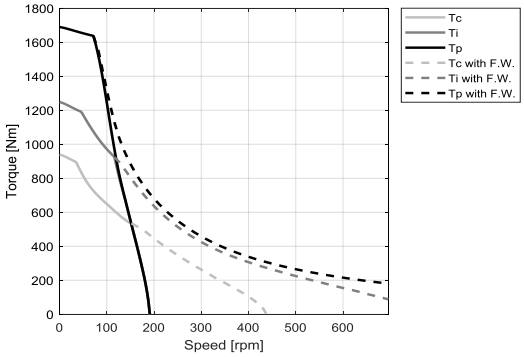
VA - WATER COOLING



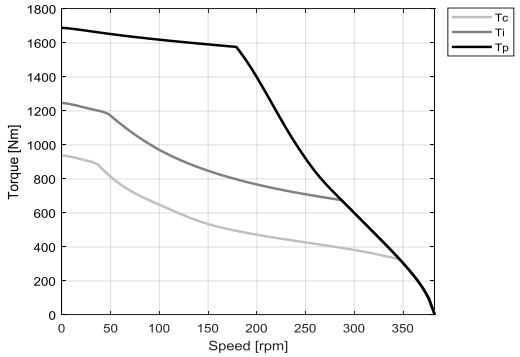
WB - WATER COOLING



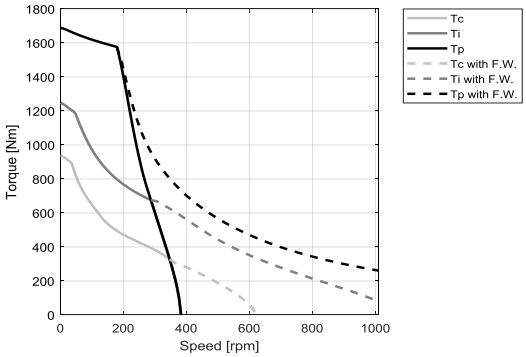
WB - WATER COOLING



WD - WATER COOLING



WD - WATER COOLING



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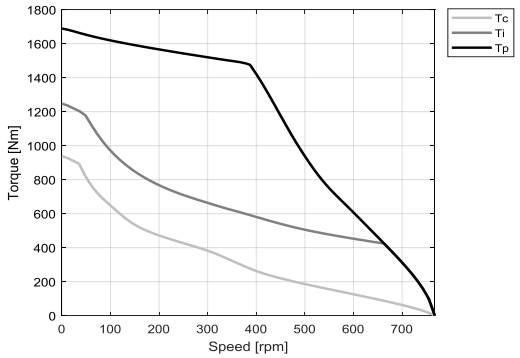
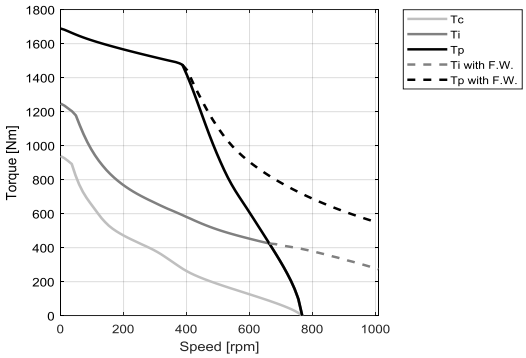


WH - WATER COOLING



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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0450-100

MOTOR PERFORMANCE		Winding codes	WA	WB	WD	WH
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	2190	2410	2410	2410
Ti	Intermittent torque	Nm	1790	1790	1790	1790
Tc	Continuous torque	Nm	1350	1350	1350	1350
Ts	Standstill torque	Nm	1100	1100	1100	1100
Ip	Peak current	Arms	36.8	93.3	187	373
Ii	Intermittent current	Arms	26.4	52.7	105	211
Ic	Continuous current	Arms	16.7	33.3	66.7	133
Is	Standstill current	Arms	12.6	25.3	50.5	101
ns	Rated low speed	rpm	0.12	0.12	0.12	0.12
nm	Maximum speed without flux weakening	rpm	66.8	134	268	536
nm,FW	Maximum speed with flux weakening	rpm	199	315	492	774
τon,p	Maximum ON time for peak cycle	s	12	5.4	5.4	5.4
τon,i	Maximum ON time for intermittent cycle	s	2.7	2.7	2.7	2.7
Pp	Power dissipation @ Ip	W	26400	44600	44600	44600
Pi	Power dissipation @ Ii	W	17600	17600	17600	17600
Pc	Power dissipation @ Ic	W	7050	7050	7050	7050
Td	Max. detent torque (average to peak)	Nm	6.6	6.6	6.6	6.6

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	103	51.6	25.8	12.9
Ku	Back EMF constant (*)	Vrms/(rad/s)	59.4	29.7	14.8	7.42
Km	Motor constant	Nm/√W	24.3	24.3	24.3	24.3
R20	Electrical resistance at 20°C (*)	Ohm	12.0	3.01	0.752	0.188
Ld/Lq	Electrical inductance (*)	mH	124 / 102	31.0 / 25.6	7.75 / 6.40	1.94 / 1.60
Isc	Maximum short-circuit current	Arms	12.6	25.1	50.2	100
nb	Base speed	rpm	25.4	101	233	514
nb,i	Base speed at intermittent duty cycle	rpm	5.49	72.4	195	449
nb,p	Base speed at peak duty cycle	rpm	0.0	39.2	122	274
nn	Rated speed	rpm	19.8	86.1	213	314
Tn	Rated torque	Nm	1310	925	625	494
In	Rated current	Arms	16.6	21.3	27.8	44.6
τth	Thermal time constant	s	112	112	112	112
Rth	Thermal resistance	K/W	0.0144	0.0144	0.0144	0.0144
2p	Number of poles	-	88	88	88	88
J	Rotor inertia	kg·m²	0.533	0.533	0.533	0.533
mr	Rotor mass	kg	16.1	16.1	16.1	16.1
ms	Stator mass	kg	62.9	62.9	62.9	62.9

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.260	0.260	0.260	0.260
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	22	22	22	22
Δpw	Max. pressure drop at qw	bar	1.4	1.4	1.4	1.4

Notes: (*) terminal to terminal.
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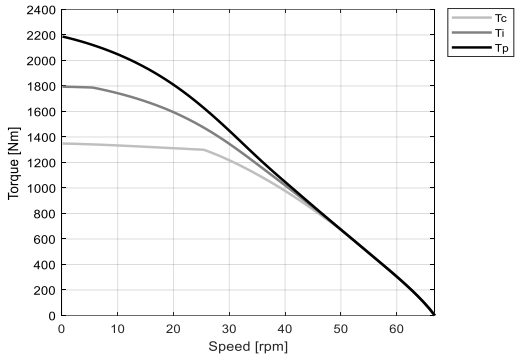
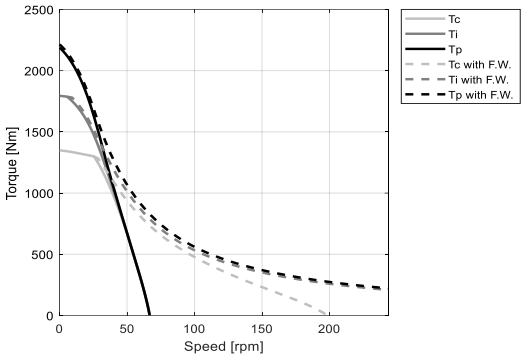
CONVENTIONAL TORQUE MOTOR TMB+0450-100

WA - WATER COOLING



WA - WATER COOLING



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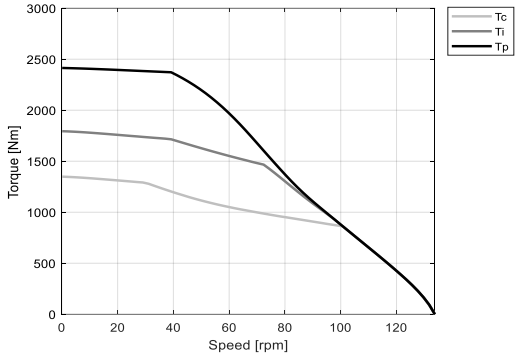
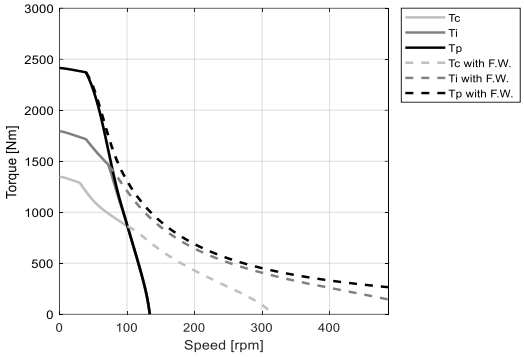


WB - WATER COOLING



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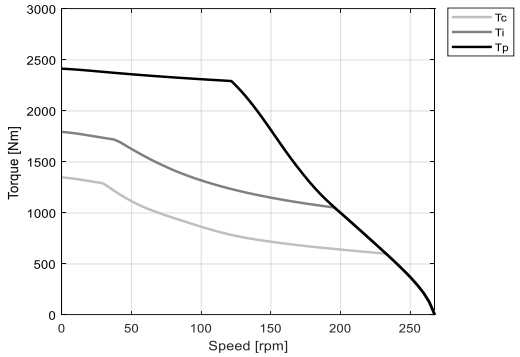

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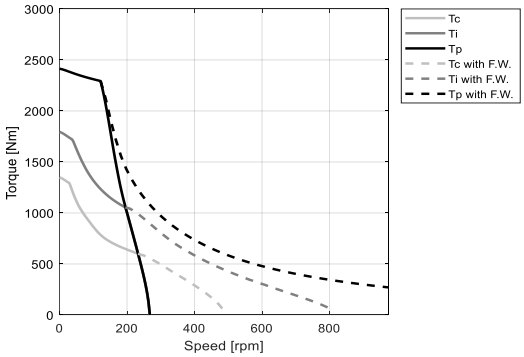
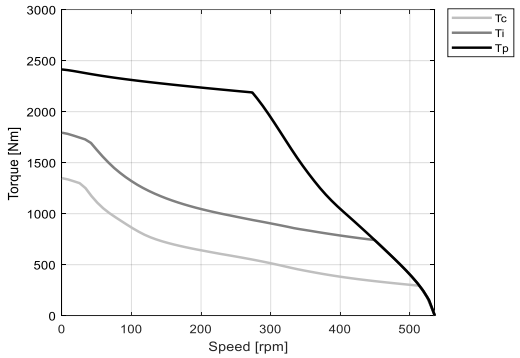
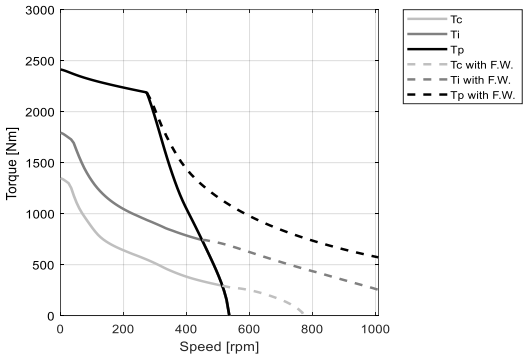


WH - WATER COOLING



WH - WATER COOLING



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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+0450-150

MOTOR PERFORMANCE		Winding codes	VB	VD	WD	WH
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	3510	3630	3620	3620
Ti	Intermittent torque	Nm	2790	2790	2730	2730
Tc	Continuous torque	Nm	2110	2110	2060	2060
Ts	Standstill torque	Nm	1730	1730	1680	1680
Ip	Peak current	Arms	63.1	137	183	365
Ii	Intermittent current	Arms	41.8	83.5	107	215
Ic	Continuous current	Arms	26.4	52.8	67.9	136
Is	Standstill current	Arms	20.0	40.0	51.4	103
ns	Rated low speed	rpm	0.12	0.12	0.12	0.12
nm	Maximum speed without flux weakening	rpm	66.6	133	178	357
nm,FW	Maximum speed with flux weakening	rpm	189	299	359	567
τon,p	Maximum ON time for peak cycle	s	8.8	6.8	5.7	5.7
τon,i	Maximum ON time for intermittent cycle	s	2.8	2.8	2.8	2.8
Pp	Power dissipation @ Ip	W	45400	54000	58000	58000
Pi	Power dissipation @ Ii	W	25300	25300	24900	24900
Pc	Power dissipation @ Ic	W	10100	10100	9970	9970
Td	Max. detent torque (average to peak)	Nm	9.8	9.8	9.8	9.8

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	104	51.9	38.8	19.4
Ku	Back EMF constant (*)	Vrms/(rad/s)	59.5	29.8	22.3	11.1
Km	Motor constant	Nm/√W	32.2	32.2	31.2	31.2
R20	Electrical resistance at 20°C (*)	Ohm	6.93	1.73	1.03	0.258
Ld/Lq	Electrical inductance (*)	mH	82.7 / 66.8	20.7 / 16.7	11.6 / 9.50	2.89 / 2.37
Isc	Maximum short-circuit current	Arms	18.9	37.8	50.5	101
nb	Base speed	rpm	31.1	105	149	332
nb,i	Base speed at intermittent duty cycle	rpm	11.2	78.6	119	285
nb,p	Base speed at peak duty cycle	rpm	0.00	47.8	73.2	177
nn	Rated speed	rpm	22.5	91.2	134	281
Tn	Rated torque	Nm	2040	1300	1080	744
In	Rated current	Arms	26.2	29.3	31.8	44.3
τth	Thermal time constant	s	114	114	113	113
Rth	Thermal resistance	K/W	0.00977	0.00977	0.00989	0.00989
2p	Number of poles	-	88	88	88	88
J	Rotor inertia	kg·m²	0.805	0.805	0.805	0.805
mr	Rotor mass	kg	24.3	24.3	24.3	24.3
ms	Stator mass	kg	88.1	88.1	87.4	87.4

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.370	0.370	0.370	0.370
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	32	32	31	31
Δpw	Max. pressure drop at qw	bar	2.8	2.8	2.7	2.7

Notes: (*) terminal to terminal.
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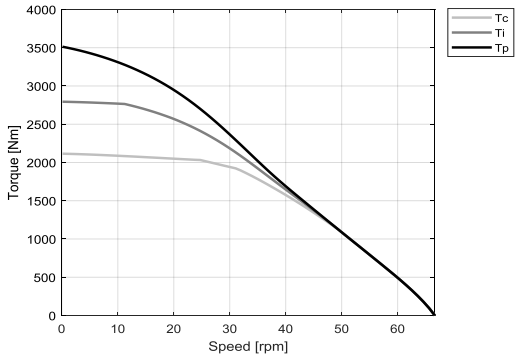
CONVENTIONAL TORQUE MOTOR TMB+0450-150

VB - WATER COOLING



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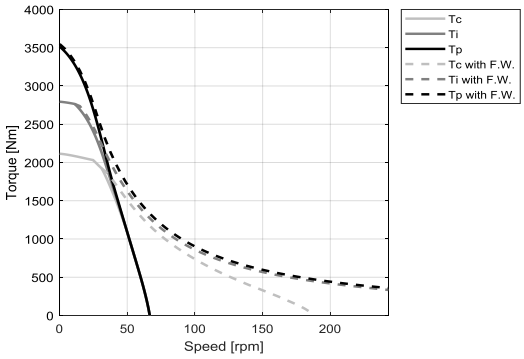
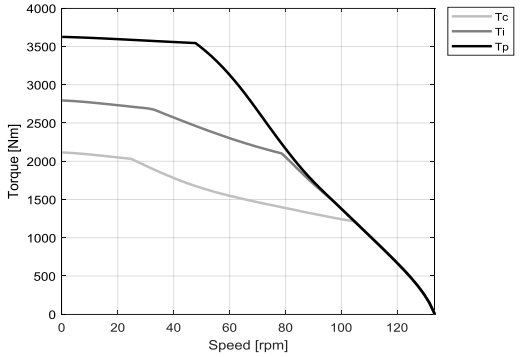


VD - WATER COOLING



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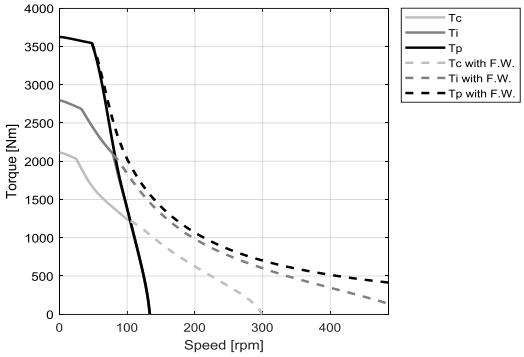
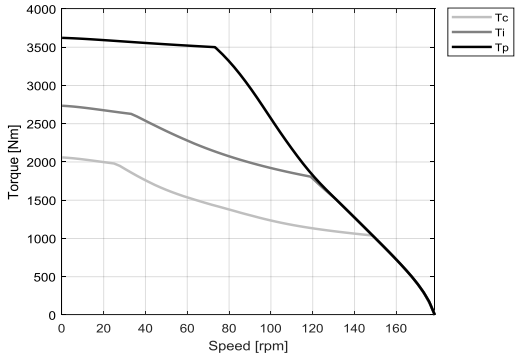


WD - WATER COOLING



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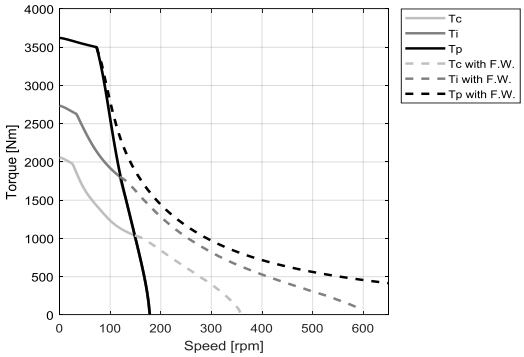

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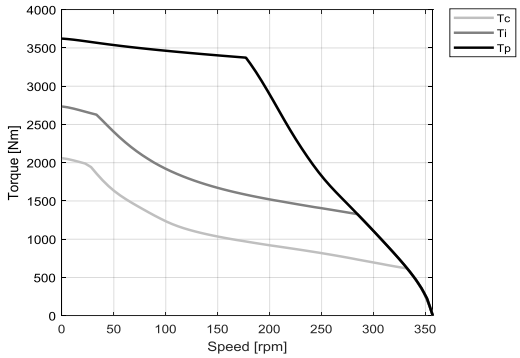

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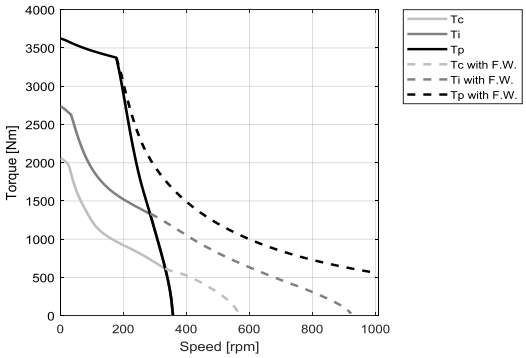

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0450-200

MOTOR PERFORMANCE		Winding codes	WB	WD	VH	WH
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	4610	4830	4830	4830
Ti	Intermittent torque	Nm	3630	3630	3710	3630
Tc	Continuous torque	Nm	2720	2720	2800	2720
Ts	Standstill torque	Nm	2220	2220	2280	2220
Ip	Peak current	Arms	80.7	181	270	362
Ii	Intermittent current	Arms	52.8	106	164	211
Ic	Continuous current	Arms	33.4	66.8	104	134
Is	Standstill current	Arms	25.3	50.6	78.8	101
ns	Rated low speed	rpm	0.12	0.12	0.12	0.12
nm	Maximum speed without flux weakening	rpm	66.8	134	200	268
nm,FW	Maximum speed with flux weakening	rpm	181	286	370	449
τon,p	Maximum ON time for peak cycle	s	6.9	4.7	5.6	4.7
τon,i	Maximum ON time for intermittent cycle	s	2.7	2.7	2.7	2.7
Pp	Power dissipation @ Ip	W	58000	74500	69200	74500
Pi	Power dissipation @ Ii	W	31200	31200	31800	31200
Pc	Power dissipation @ Ic	W	12500	12500	12700	12500
Td	Max. detent torque (average to peak)	Nm	13	13	13	13

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	103	51.7	34.6	25.9
Ku	Back EMF constant (*)	Vrms/(rad/s)	59.4	29.7	19.8	14.8
Km	Motor constant	Nm/√W	36.3	36.3	37.5	36.3
R20	Electrical resistance at 20°C (*)	Ohm	5.43	1.36	0.569	0.339
Ld/Lq	Electrical inductance (*)	mH	61.5 / 50.9	15.4 / 12.7	6.88 / 5.59	3.84 / 3.18
Isc	Maximum short-circuit current	Arms	25.3	50.7	75.8	101
nb	Base speed	rpm	32.5	107	172	240
nb,i	Base speed at intermittent duty cycle	rpm	12.5	80.8	143	205
nb,p	Base speed at peak duty cycle	rpm	0.00	46.4	89.6	127
nn	Rated speed	rpm	23.4	93.9	157	221
Tn	Rated torque	Nm	2620	1620	1310	1110
In	Rated current	Arms	33.1	36.1	43.1	49.1
τth	Thermal time constant	s	113	113	114	113
Rth	Thermal resistance	K/W	0.00749	0.00749	0.00741	0.00749
2p	Number of poles	-	88	88	88	88
J	Rotor inertia	kg·m²	1.08	1.08	1.08	1.08
mr	Rotor mass	kg	32.6	32.6	32.6	32.6
ms	Stator mass	kg	111	111	112	111

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.480	0.480	0.480	0.480
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	39	39	40	39
Δpw	Max. pressure drop at qw	bar	4.5	4.5	4.6	4.5

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
Please refer to ETEL Integration Manual for the mass of the optional cooling jacket and the possible additional pressure drop.

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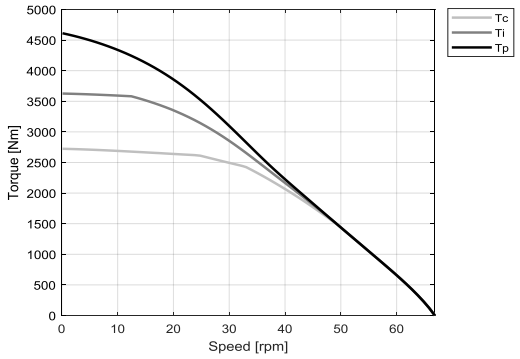
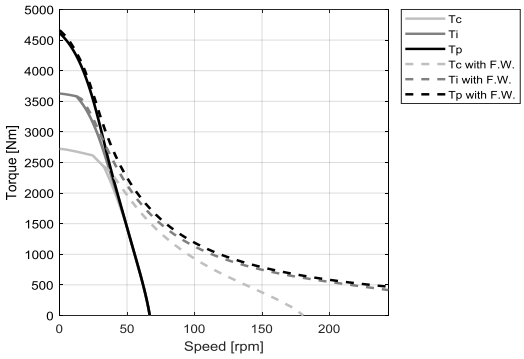
CONVENTIONAL TORQUE MOTOR TMB+0450-200

WB - WATER COOLING



WB - WATER COOLING



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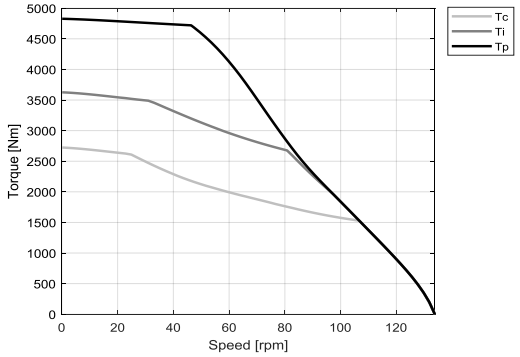
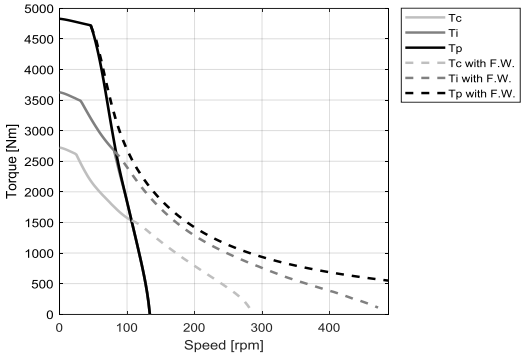
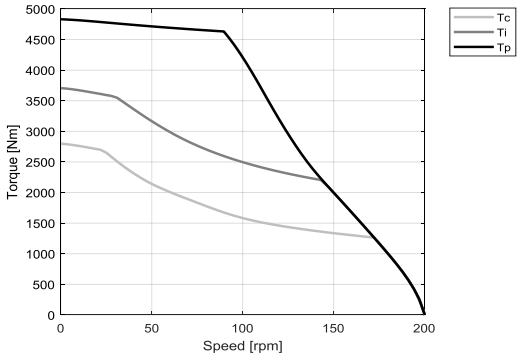


WD - WATER COOLING



VH - WATER COOLING



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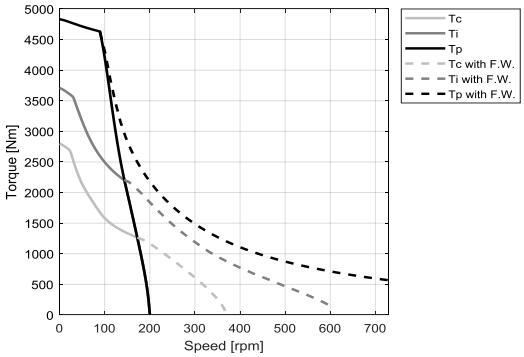

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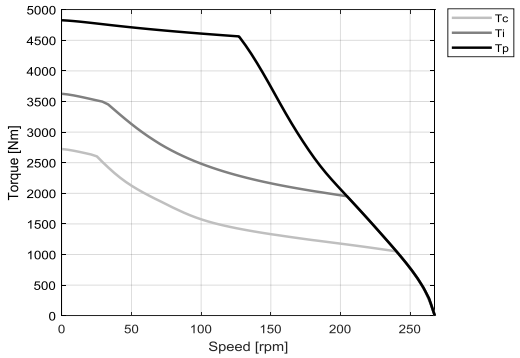

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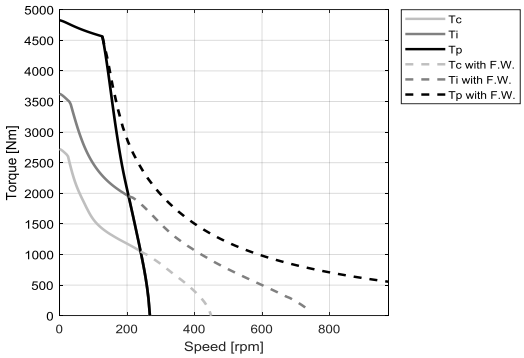

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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+0530-050

		Winding codes	WA	WB	WD	WH
MOTOR PERFORMANCE		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	1730	1730	1730	1730
Ti	Intermittent torque	Nm	1340	1340	1340	1340
Tc	Continuous torque	Nm	1010	1010	1000	1000
Ts	Standstill torque	Nm	817	817	818	818
Ip	Peak current	Arms	38.1	76.3	153	305
Ii	Intermittent current	Arms	23.8	47.6	94.6	189
Ic	Continuous current	Arms	15.1	30.1	59.8	120
Is	Standstill current	Arms	11.4	22.8	45.7	91.3
ns	Rated low speed	rpm	0.10	0.10	0.10	0.10
nm	Maximum speed without flux weakening	rpm	81.1	162	325	651
nm,FW	Maximum speed with flux weakening	rpm	290	435	621	774
τon,p	Maximum ON time for peak cycle	s	11	11	11	11
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	4.2	4.2
Pp	Power dissipation @ Ip	W	22500	22500	22500	22500
Pi	Power dissipation @ Ii	W	11200	11200	11000	11000
Pc	Power dissipation @ Ic	W	4480	4480	4390	4390
Td	Max. detent torque (average to peak)	Nm	5.0	5.0	5.0	5.0

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	84.9	42.5	21.2	10.6
Ku	Back EMF constant (*)	Vrms/(rad/s)	48.9	24.5	12.2	6.12
Km	Motor constant	Nm/√W	22.8	22.8	22.8	22.8
R20	Electrical resistance at 20°C (*)	Ohm	9.26	2.31	0.579	0.145
Ld/Lq	Electrical inductance (*)	mH	135 / 109	33.8 / 27.3	8.45 / 6.84	2.11 / 1.71
Isc	Maximum short-circuit current	Arms	9.49	19.0	38.0	75.9
nb	Base speed	rpm	41.9	117	279	638
nb,i	Base speed at intermittent duty cycle	rpm	24.5	88.4	221	524
nb,p	Base speed at peak duty cycle	rpm	14.3	63.7	149	316
nn	Rated speed	rpm	34.0	102	254	380
Tn	Rated torque	Nm	925	675	428	329
In	Rated current	Arms	14.2	19.0	23.5	37.2
τth	Thermal time constant	s	136	136	136	136
Rth	Thermal resistance	K/W	0.0235	0.0235	0.0235	0.0235
2p	Number of poles	-	88	88	88	88
J	Rotor inertia	kg·m²	0.470	0.470	0.470	0.470
mr	Rotor mass	kg	9.77	9.77	9.77	9.77
ms	Stator mass	kg	49.8	49.8	49.8	49.8

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.180	0.180	0.180	0.180
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	14	14	14	14
Δpw	Max. pressure drop at qw	bar	0.5	0.5	0.5	0.5

Notes: (*) terminal to terminal.
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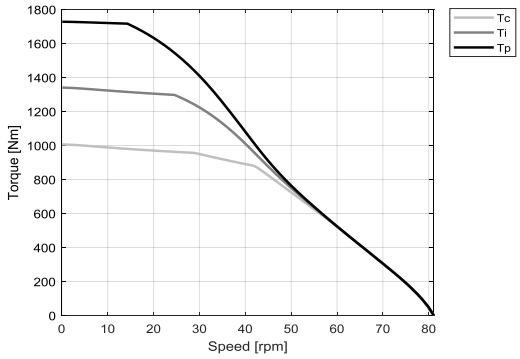
CONVENTIONAL TORQUE MOTOR TMB+0530-050

WA - WATER COOLING



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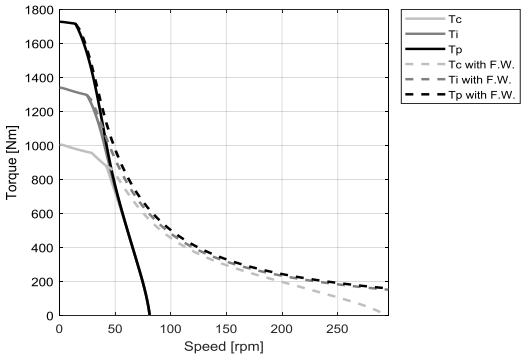

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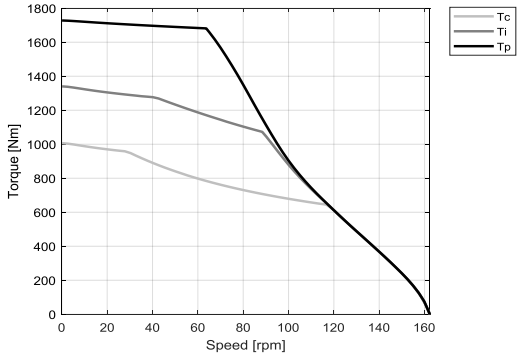

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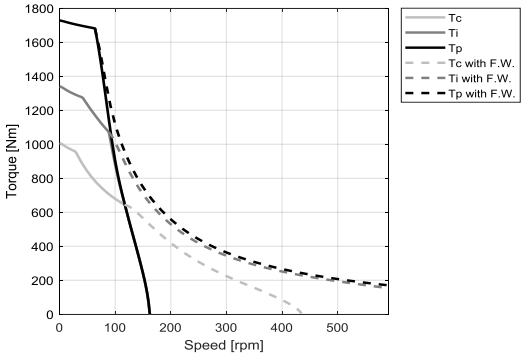

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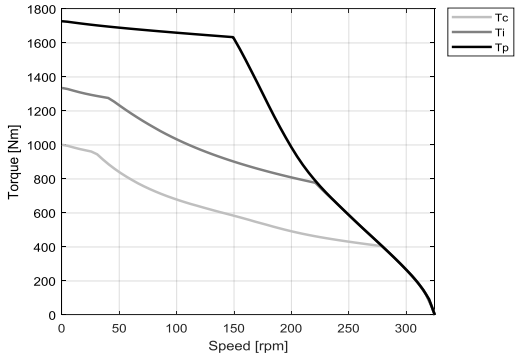

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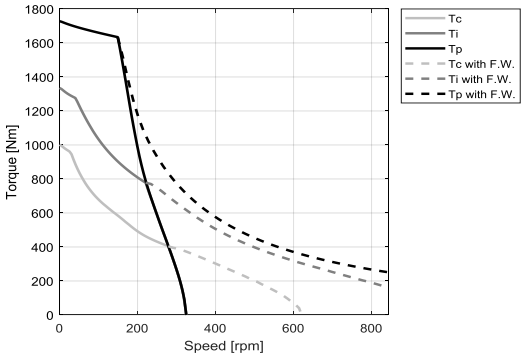

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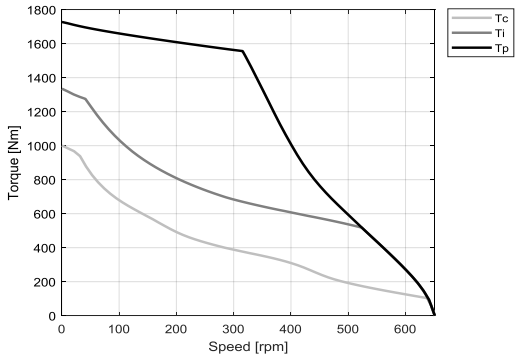
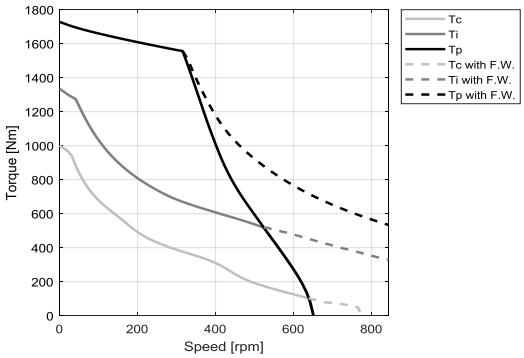


WH - WATER COOLING



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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+0530-070

MOTOR PERFORMANCE		Winding codes	WA	WB	WD	WH
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	2420	2420	2420	2420
Ti	Intermittent torque	Nm	1930	1930	1900	1900
Tc	Continuous torque	Nm	1450	1450	1420	1420
Ts	Standstill torque	Nm	1180	1180	1180	1180
Ip	Peak current	Arms	36.8	73.6	147	294
Ii	Intermittent current	Arms	24.4	48.8	94.6	189
Ic	Continuous current	Arms	15.4	30.8	59.8	120
Is	Standstill current	Arms	11.7	23.4	46.7	93.4
ns	Rated low speed	rpm	0.10	0.10	0.10	0.10
nm	Maximum speed without flux weakening	rpm	57.9	116	232	465
nm,FW	Maximum speed with flux weakening	rpm	199	295	447	596
τon,p	Maximum ON time for peak cycle	s	12	12	12	12
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	7.8	7.8
Pp	Power dissipation @ Ip	W	26500	26500	26500	26500
Pi	Power dissipation @ Ii	W	15000	15000	13700	13700
Pc	Power dissipation @ Ic	W	5990	5990	5500	5500
Td	Max. detent torque (average to peak)	Nm	7.0	7.0	7.0	7.0

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	119	59.6	29.8	14.9
Ku	Back EMF constant (*)	Vrms/(rad/s)	68.5	34.2	17.1	8.56
Km	Motor constant	Nm/√W	28.3	28.3	28.3	28.3
R20	Electrical resistance at 20°C (*)	Ohm	11.8	2.96	0.740	0.185
Ld/Lq	Electrical inductance (*)	mH	180 / 144	44.9 / 36.1	11.2 / 9.15	2.80 / 2.29
Isc	Maximum short-circuit current	Arms	10.0	20.0	40.1	80.1
nb	Base speed	rpm	24.7	82.9	199	454
nb,i	Base speed at intermittent duty cycle	rpm	9.05	61.0	159	379
nb,p	Base speed at peak duty cycle	rpm	0.164	42.7	108	233
nn	Rated speed	rpm	18.7	71.7	181	278
Tn	Rated torque	Nm	1390	975	623	474
In	Rated current	Arms	15.3	19.4	24.0	37.5
τth	Thermal time constant	s	134	134	134	134
Rth	Thermal resistance	K/W	0.0175	0.0175	0.0175	0.0175
2p	Number of poles	-	88	88	88	88
J	Rotor inertia	kg·m²	0.659	0.659	0.659	0.659
mr	Rotor mass	kg	13.7	13.7	13.7	13.7
ms	Stator mass	kg	62.1	62.1	62.1	62.1

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.240	0.240	0.240	0.240
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	19	19	17	17
Δpw	Max. pressure drop at qw	bar	0.7	0.7	0.7	0.7

Notes: (*) terminal to terminal.
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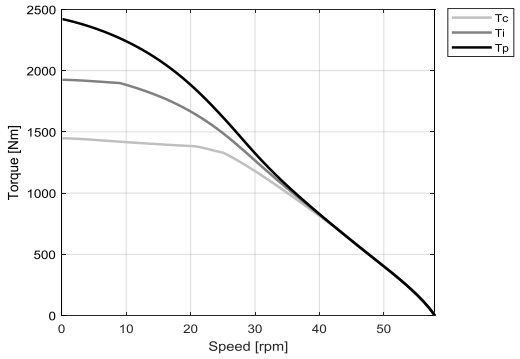
CONVENTIONAL TORQUE MOTOR TMB+0530-070

WA - WATER COOLING



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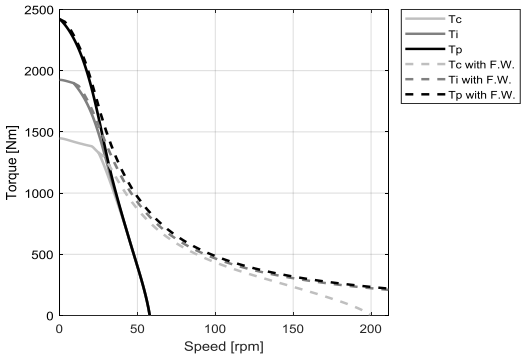

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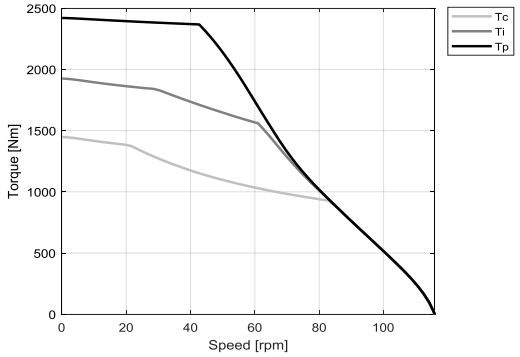

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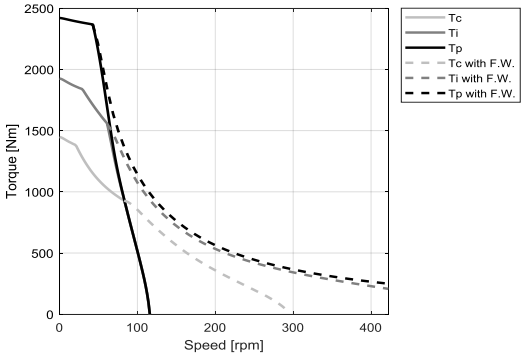

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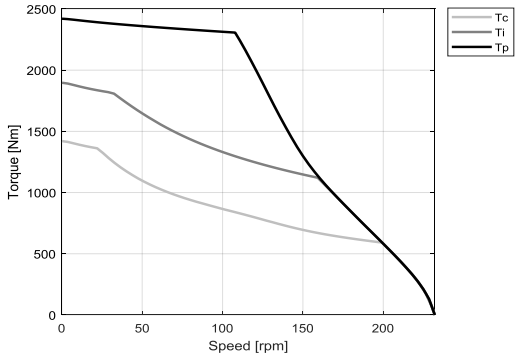

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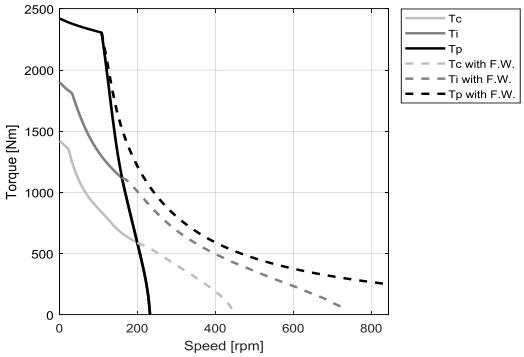

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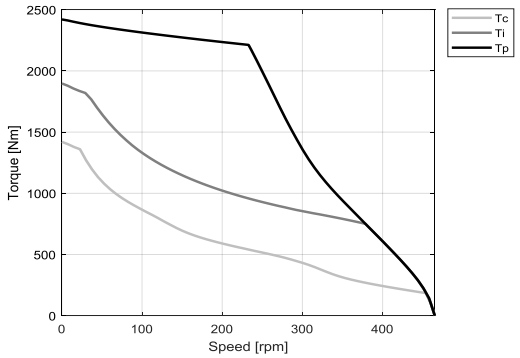

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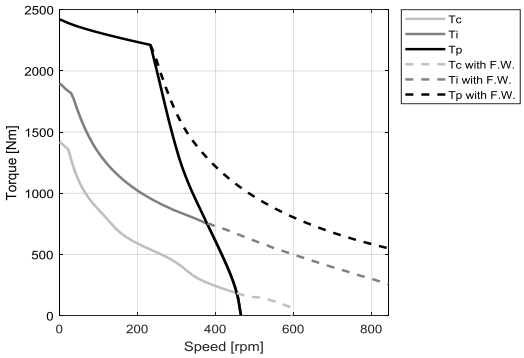

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0530-100

MOTOR PERFORMANCE		Winding codes	WA	WB	WD	WH
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	3120	3460	3460	3460
Ti	Intermittent torque	Nm	2700	2820	2740	2740
Tc	Continuous torque	Nm	2120	2120	2050	2050
Ts	Standstill torque	Nm	1730	1730	1740	1740
Ip	Peak current	Arms	28.7	71.7	143	287
Ii	Intermittent current	Arms	22.9	50.0	94.6	189
Ic	Continuous current	Arms	15.8	31.6	59.8	120
Is	Standstill current	Arms	12.0	24.0	47.9	95.8
ns	Rated low speed	rpm	0.11	0.11	0.11	0.11
nm	Maximum speed without flux weakening	rpm	40.5	81.1	162	325
nm,FW	Maximum speed with flux weakening	rpm	145	213	339	515
τon,p	Maximum ON time for peak cycle	s	27	13	13	13
τon,i	Maximum ON time for intermittent cycle	s	18	2.9	11	11
Pp	Power dissipation @ Ip	W	20600	33100	33100	33100
Pi	Power dissipation @ Ii	W	16500	20900	17900	17900
Pc	Power dissipation @ Ic	W	8350	8350	7160	7160
Td	Max. detent torque (average to peak)	Nm	10	10	10	10

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	170	85.2	42.6	21.3
Ku	Back EMF constant (*)	Vrms/(rad/s)	97.9	48.9	24.5	12.2
Km	Motor constant	Nm/√W	35.0	35.0	35.0	35.0
R20	Electrical resistance at 20°C (*)	Ohm	15.8	3.94	0.985	0.246
Ld/Lq	Electrical inductance (*)	mH	244 / 195	61.0 / 48.7	15.2 / 12.5	3.81 / 3.13
Isc	Maximum short-circuit current	Arms	10.5	21.1	42.1	84.3
nb	Base speed	rpm	10.5	54.3	135	301
nb,i	Base speed at intermittent duty cycle	rpm	0.00	35.2	108	256
nb,p	Base speed at peak duty cycle	rpm	0.00	24.6	74.1	166
nn	Rated speed	rpm	6.88	46.0	121	279
Tn	Rated torque	Nm	2090	1540	1050	654
In	Rated current	Arms	15.8	21.7	28.0	36.0
τth	Thermal time constant	s	126	126	126	126
Rth	Thermal resistance	K/W	0.0123	0.0123	0.0123	0.0123
2p	Number of poles	-	88	88	88	88
J	Rotor inertia	kg·m²	0.933	0.933	0.933	0.933
mr	Rotor mass	kg	19.4	19.4	19.4	19.4
ms	Stator mass	kg	78.8	78.8	78.8	78.8

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.320	0.320	0.320	0.320
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	26	26	22	22
Δpw	Max. pressure drop at qw	bar	1.5	1.5	1.2	1.2

Notes: (*) terminal to terminal.
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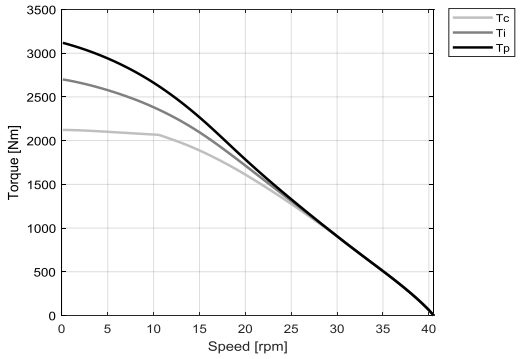
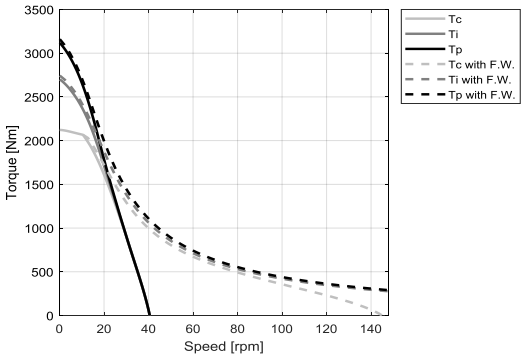
CONVENTIONAL TORQUE MOTOR TMB+0530-100

WA - WATER COOLING



WA - WATER COOLING



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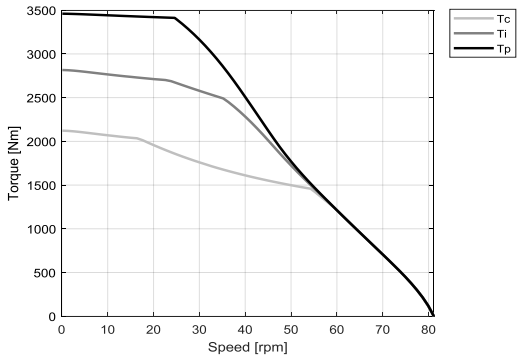

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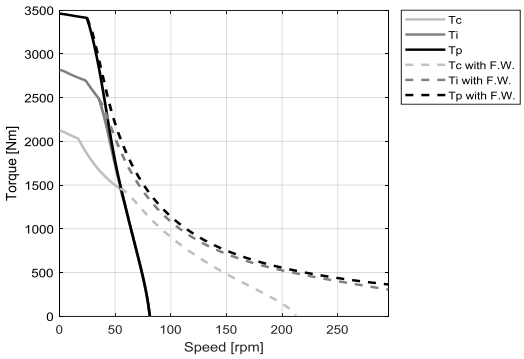

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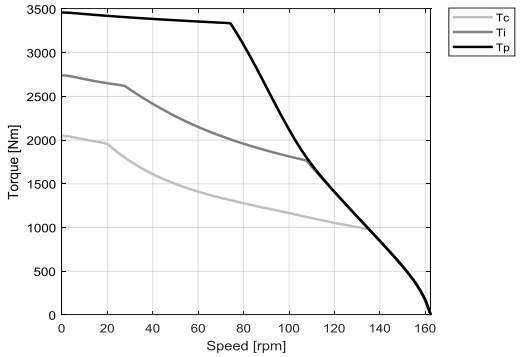

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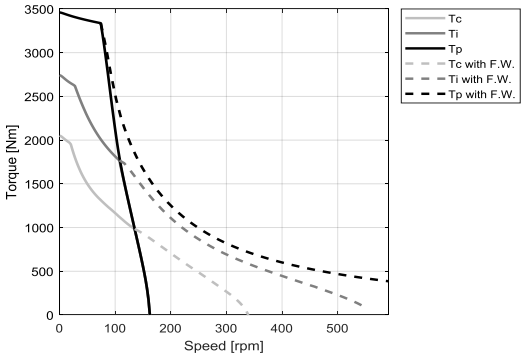
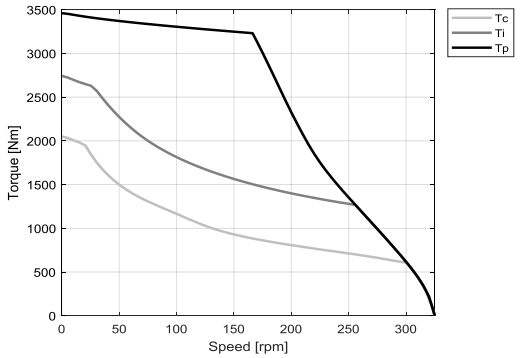
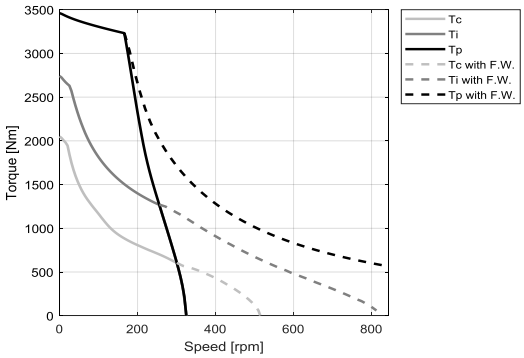


WH - WATER COOLING



WH - WATER COOLING



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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0530-150

MOTOR PERFORMANCE		Winding codes	WB	UD	WD	WH
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	5190	5190	5190	5190
Ti	Intermittent torque	Nm	4240	4150	4130	4130
Tc	Continuous torque	Nm	3190	3110	3090	3090
Ts	Standstill torque	Nm	2600	2530	2610	2610
Ip	Peak current	Arms	70.7	97.5	141	283
Ii	Intermittent current	Arms	49.8	66.2	94.6	189
Ic	Continuous current	Arms	31.5	41.9	59.8	120
Is	Standstill current	Arms	23.9	31.7	47.8	95.5
ns	Rated low speed	rpm	0.11	0.11	0.11	0.11
nm	Maximum speed without flux weakening	rpm	54.1	74.6	108	217
nm,FW	Maximum speed with flux weakening	rpm	156	190	244	386
τon,p	Maximum ON time for peak cycle	s	12	10	12	12
τon,i	Maximum ON time for intermittent cycle	s	2.8	2.8	9.4	9.4
Pp	Power dissipation @ Ip	W	45700	48800	45700	45700
Pi	Power dissipation @ Ii	W	29300	28800	25400	25400
Pc	Power dissipation @ Ic	W	11700	11500	10100	10100
Td	Max. detent torque (average to peak)	Nm	15	15	15	15

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	128	92.8	63.9	32.0
Ku	Back EMF constant (*)	Vrms/(rad/s)	73.4	53.2	36.7	18.3
Km	Motor constant	Nm/√W	44.1	42.8	44.1	44.1
R20	Electrical resistance at 20°C (*)	Ohm	5.62	3.14	1.40	0.351
Ld/Lq	Electrical inductance (*)	mH	90.7 / 72.8	47.7 / 39.0	22.7 / 18.7	5.67 / 4.66
Isc	Maximum short-circuit current	Arms	21.2	29.3	42.5	85.0
nb	Base speed	rpm	29.0	49.8	83.4	192
nb,i	Base speed at intermittent duty cycle	rpm	10.3	31.3	64.1	161
nb,p	Base speed at peak duty cycle	rpm	6.13	20.2	43.8	107
nn	Rated speed	rpm	22.7	42.1	73.0	177
Tn	Rated torque	Nm	2770	2280	1900	1220
In	Rated current	Arms	27.1	29.1	34.0	43.5
τth	Thermal time constant	s	127	125	127	127
Rth	Thermal resistance	K/W	0.00847	0.00859	0.00847	0.00847
2p	Number of poles	-	88	88	88	88
J	Rotor inertia	kg·m²	1.41	1.41	1.41	1.41
mr	Rotor mass	kg	29.2	29.2	29.2	29.2
ms	Stator mass	kg	110	109	110	110

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.450	0.450	0.450	0.450
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	37	36	32	32
Δpw	Max. pressure drop at qw	bar	2.9	2.8	2.3	2.3

Notes: (*) terminal to terminal.
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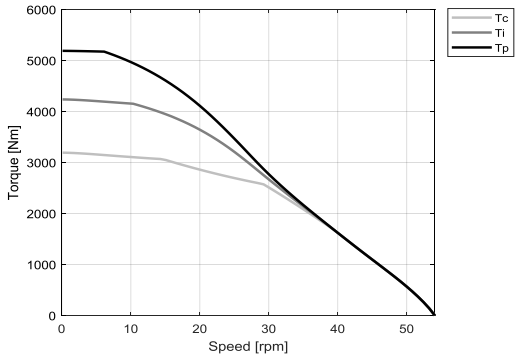
CONVENTIONAL TORQUE MOTOR TMB+0530-150

WB - WATER COOLING



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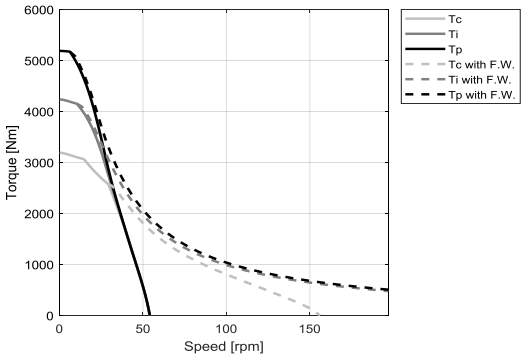
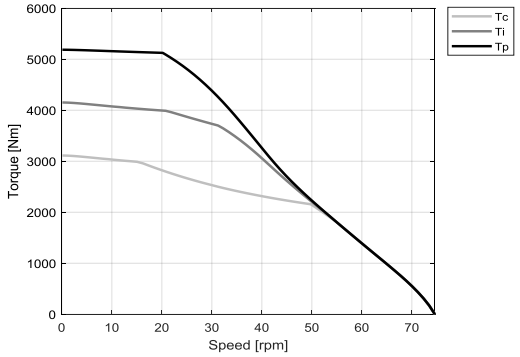


UD - WATER COOLING



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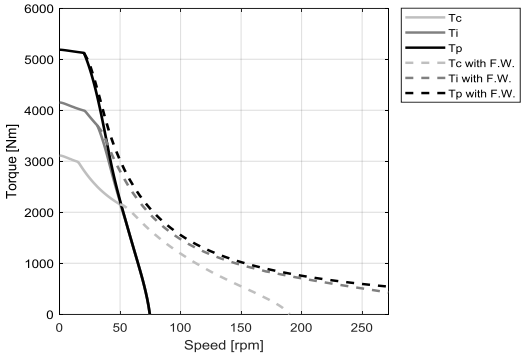
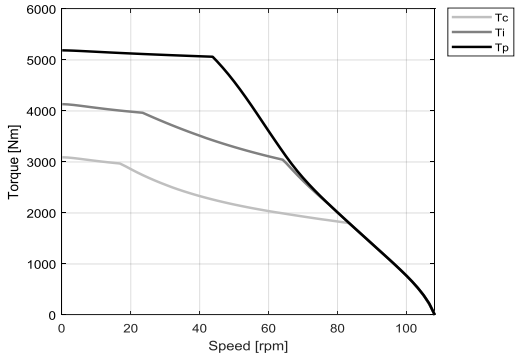


WD - WATER COOLING



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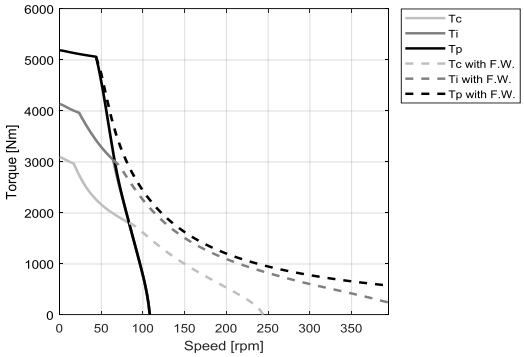

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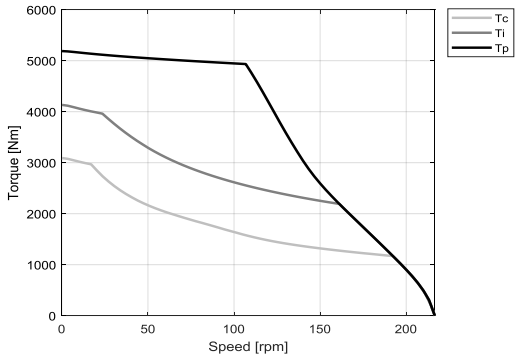

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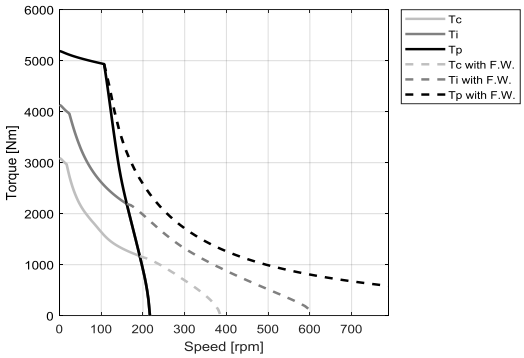

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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+0530-200

		Winding codes	WD	WH		
MOTOR PERFORMANCE		UNIT	WATER COOLING	WATER COOLING		
Tp	Peak torque	Nm	6920	6920		
Ti	Intermittent torque	Nm	5520	5520		
Tc	Continuous torque	Nm	4130	4130		
Ts	Standstill torque	Nm	3450	3450		
Ip	Peak current	Arms	140	280		
Ii	Intermittent current	Arms	94.6	189		
Ic	Continuous current	Arms	59.8	120		
Is	Standstill current	Arms	47.1	94.3		
ns	Rated low speed	rpm	0.11	0.11		
nm	Maximum speed without flux weakening	rpm	81.2	162		
nm,FW	Maximum speed with flux weakening	rpm	193	308		
τon,p	Maximum ON time for peak cycle	s	10	10		
τon,i	Maximum ON time for intermittent cycle	s	6.7	6.7		
Pp	Power dissipation @ Ip	W	58500	58500		
Pi	Power dissipation @ Ii	W	33100	33100		
Pc	Power dissipation @ Ic	W	13200	13200		
Td	Max. detent torque (average to peak)	Nm	20	20		

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	85.3	42.7		
Ku	Back EMF constant (*)	Vrms/(rad/s)	48.9	24.5		
Km	Motor constant	Nm/√W	51.4	51.4		
R20	Electrical resistance at 20°C (*)	Ohm	1.84	0.459		
Ld/Lq	Electrical inductance (*)	mH	30.1 / 24.8	7.53 / 6.20		
Isc	Maximum short-circuit current	Arms	42.6	85.3		
nb	Base speed	rpm	58.5	140		
nb,i	Base speed at intermittent duty cycle	rpm	41.9	115		
nb,p	Base speed at peak duty cycle	rpm	27.5	76.5		
nn	Rated speed	rpm	50.5	128		
Tn	Rated torque	Nm	2790	1810		
In	Rated current	Arms	37.8	48.0		
τth	Thermal time constant	s	127	127		
Rth	Thermal resistance	K/W	0.00642	0.00642		
2p	Number of poles	-	88	88		
J	Rotor inertia	kg·m²	1.89	1.89		
mr	Rotor mass	kg	39.2	39.2		
ms	Stator mass	kg	140	140		

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600		
Di	Intermittent duty cycle	%	40	40		
Dp	Peak duty cycle	%	5.0	5.0		
Sr	Rotor exchange surface	m²	0.580	0.580		
θamb	Ambient temperature	°C	20	20		
θmax	Maximum coil temperature	°C	130	130		
θw	Inlet water temperature	°C	20	20		
Δθw	Water temperature difference for Pc	K	5.0	5.0		
qw	Minimum water flow for Δθw	l/min	41	41		
Δpw	Max. pressure drop at qw	bar	4.0	4.0		

Notes: (*) terminal to terminal.
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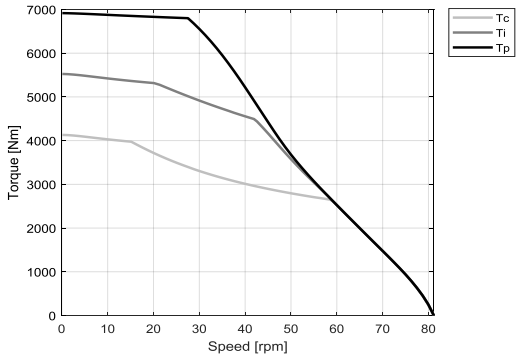
CONVENTIONAL TORQUE MOTOR TMB+0530-200

WD - WATER COOLING



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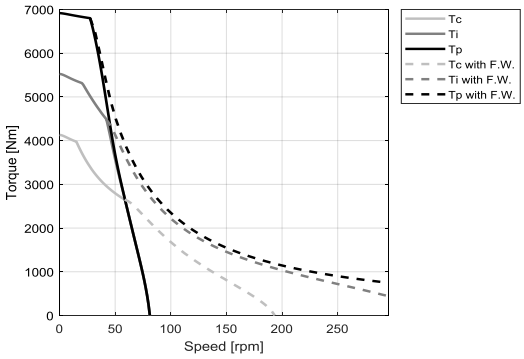

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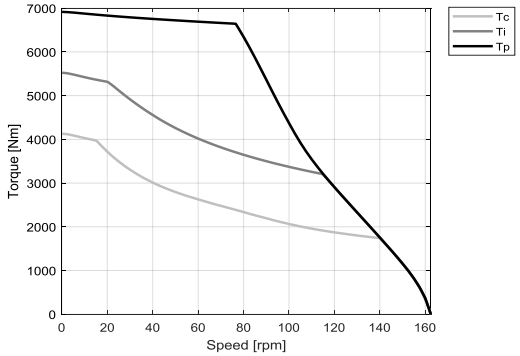

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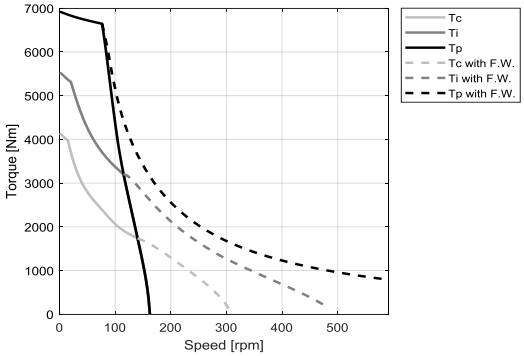

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0760-050

MOTOR PERFORMANCE		Winding codes	UB	WB	WC	WL
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	3830	3880	3880	3880
Ti	Intermittent torque	Nm	2790	2840	2840	2840
Tc	Continuous torque	Nm	2070	2110	2110	2110
Ts	Standstill torque	Nm	1670	1710	1710	1710
Ip	Peak current	Arms	54.4	81.7	122	490
Ii	Intermittent current	Arms	30.0	44.7	67.1	268
Ic	Continuous current	Arms	19.0	28.3	42.4	170
Is	Standstill current	Arms	14.4	21.4	32.1	129
ns	Rated low speed	rpm	0.067	0.065	0.065	0.065
nm	Maximum speed without flux weakening	rpm	51.1	74.1	111	446
nm,FW	Maximum speed with flux weakening	rpm	186	244	308	534
τon,p	Maximum ON time for peak cycle	s	8.1	8.3	8.3	8.3
τon,i	Maximum ON time for intermittent cycle	s	3.0	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	39200	39900	39900	39900
Pi	Power dissipation @ Ii	W	14800	14800	14800	14800
Pc	Power dissipation @ Ic	W	5900	5930	5930	5930
Td	Max. detent torque (average to peak)	Nm	10	10	10	10

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	135	93.0	62.0	15.5
Ku	Back EMF constant (*)	Vrms/(rad/s)	77.7	53.6	35.7	8.93
Km	Motor constant	Nm/√W	39.7	40.7	40.7	40.7
R20	Electrical resistance at 20°C (*)	Ohm	7.68	3.47	1.54	0.0964
Ld/Lq	Electrical inductance (*)	mH	107 / 90.2	50.8 / 42.3	22.6 / 18.8	1.41 / 1.18
Isc	Maximum short-circuit current	Arms	12.7	18.4	27.7	111
nb	Base speed	rpm	23.4	45.1	78.7	438
nb,i	Base speed at intermittent duty cycle	rpm	14.3	30.3	59.1	353
nb,p	Base speed at peak duty cycle	rpm	0.00	19.3	40.5	207
nn	Rated speed	rpm	19.7	38.3	68.6	254
Tn	Rated torque	Nm	1970	1760	1480	730
In	Rated current	Arms	18.8	23.6	28.4	56.4
τth	Thermal time constant	s	136	140	140	140
Rth	Thermal resistance	K/W	0.0179	0.0179	0.0179	0.0179
2p	Number of poles	-	132	132	132	132
J	Rotor inertia	kg·m²	1.66	1.66	1.66	1.66
mr	Rotor mass	kg	14.8	14.8	14.8	14.8
ms	Stator mass	kg	80.9	81.6	81.6	81.6

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.280	0.280	0.280	0.280
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	18	19	19	19
Δpw	Max. pressure drop at qw	bar	0.7	0.7	0.7	0.7

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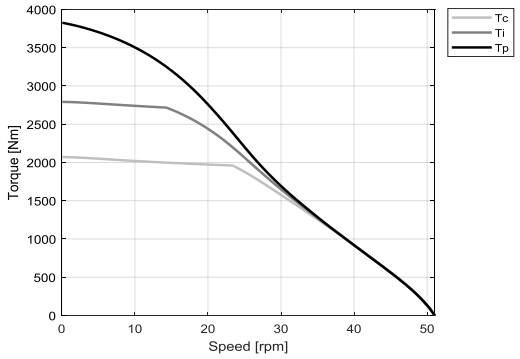
CONVENTIONAL TORQUE MOTOR TMB+0760-050

UB - WATER COOLING



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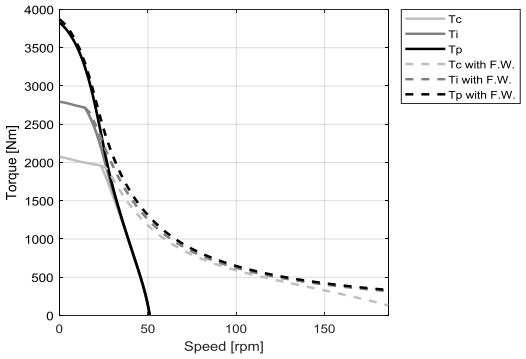
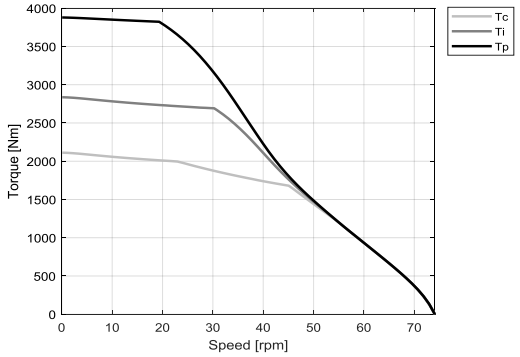


WB - WATER COOLING



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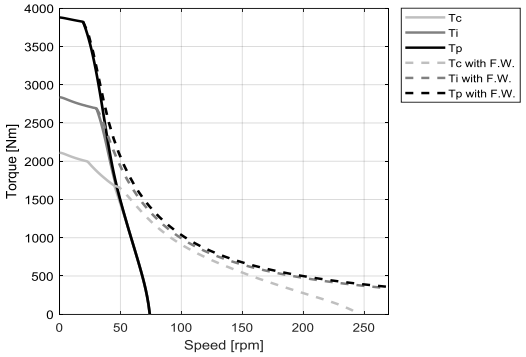

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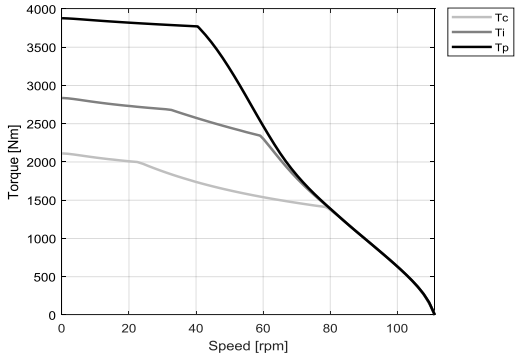

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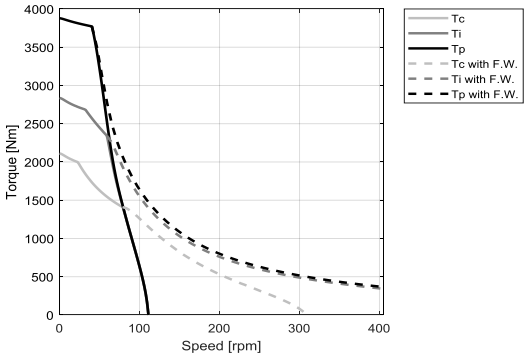
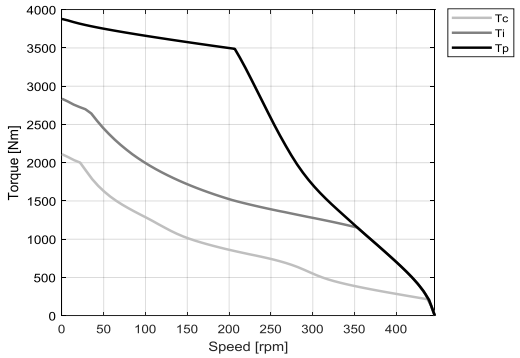
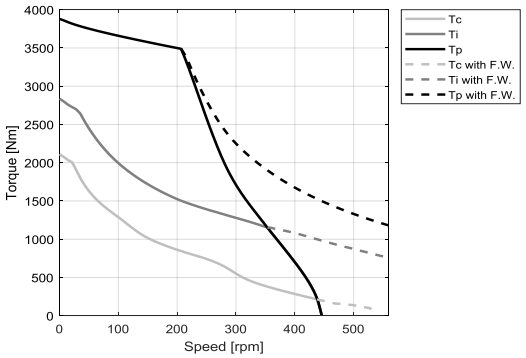


WL - WATER COOLING



WL - WATER COOLING



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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0760-070

MOTOR PERFORMANCE		Winding codes	UB	WC	WF	WL
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	4990	5430	5430	5430
Ti	Intermittent torque	Nm	4000	4070	4070	4070
Tc	Continuous torque	Nm	2970	3030	3030	3030
Ts	Standstill torque	Nm	2390	2450	2450	2450
Ip	Peak current	Arms	44.5	118	236	472
Ii	Intermittent current	Arms	30.5	68.4	137	273
Ic	Continuous current	Arms	19.3	43.2	86.5	173
Is	Standstill current	Arms	14.6	32.8	65.5	131
ns	Rated low speed	rpm	0.068	0.066	0.066	0.066
nm	Maximum speed without flux weakening	rpm	36.5	79.4	159	319
nm,FW	Maximum speed with flux weakening	rpm	133	207	305	400
τon,p	Maximum ON time for peak cycle	s	15	9.3	9.3	9.3
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	32000	46600	46600	46600
Pi	Power dissipation @ Ii	W	19600	19600	19600	19600
Pc	Power dissipation @ Ic	W	7830	7860	7860	7860
Td	Max. detent torque (average to peak)	Nm	14	14	14	14

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	189	86.9	43.5	21.7
Ku	Back EMF constant (*)	Vrms/(rad/s)	109	50.0	25.0	12.5
Km	Motor constant	Nm/√W	49.2	50.5	50.5	50.5
R20	Electrical resistance at 20°C (*)	Ohm	9.85	1.97	0.493	0.123
Ld/Lq	Electrical inductance (*)	mH	142 / 120	30.0 / 24.9	7.49 / 6.24	1.87 / 1.56
Isc	Maximum short-circuit current	Arms	13.4	29.2	58.4	117
nb	Base speed	rpm	13.9	56.2	136	312
nb,i	Base speed at intermittent duty cycle	rpm	4.34	41.1	107	257
nb,p	Base speed at peak duty cycle	rpm	0.00	26.7	70.2	153
nn	Rated speed	rpm	11.0	48.7	124	186
Tn	Rated torque	Nm	2870	2100	1340	1040
In	Rated current	Arms	19.2	28.5	35.5	56.2
τth	Thermal time constant	s	134	138	138	138
Rth	Thermal resistance	K/W	0.0134	0.0134	0.0134	0.0134
2p	Number of poles	-	132	132	132	132
J	Rotor inertia	kg·m²	2.32	2.32	2.32	2.32
mr	Rotor mass	kg	20.8	20.8	20.8	20.8
ms	Stator mass	kg	98.7	99.5	99.5	99.5

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.360	0.360	0.360	0.360
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	24	25	25	25
Δpw	Max. pressure drop at qw	bar	1.1	1.1	1.1	1.1

Notes: (*) terminal to terminal.
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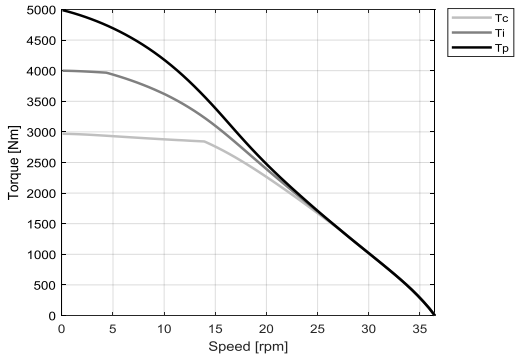
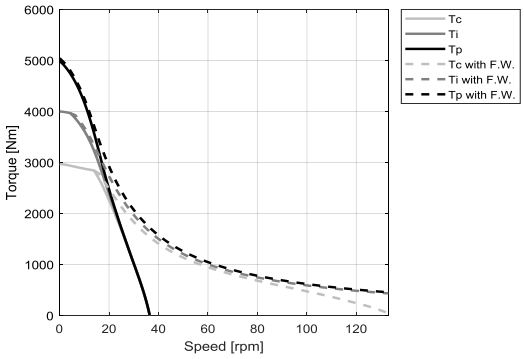
CONVENTIONAL TORQUE MOTOR TMB+0760-070

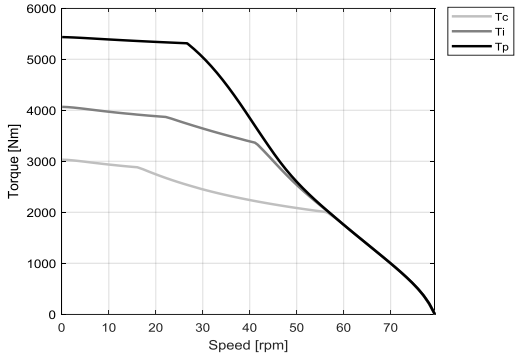
UB - WATER COOLING



UB - WATER COOLING



WC - WATER COOLING



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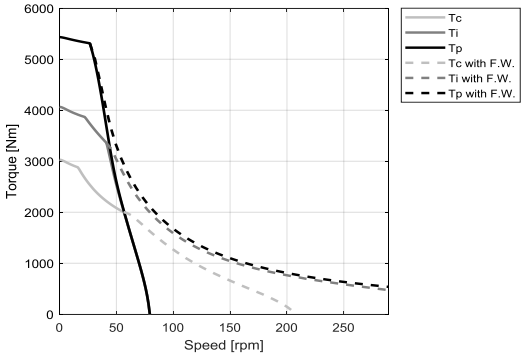
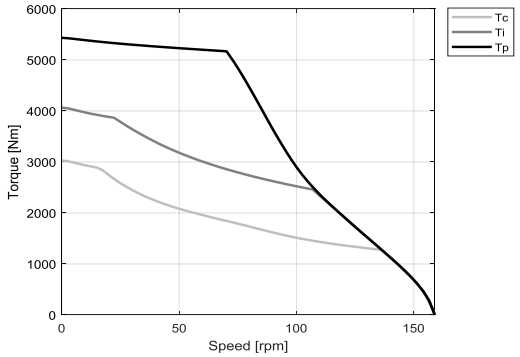


WF - WATER COOLING



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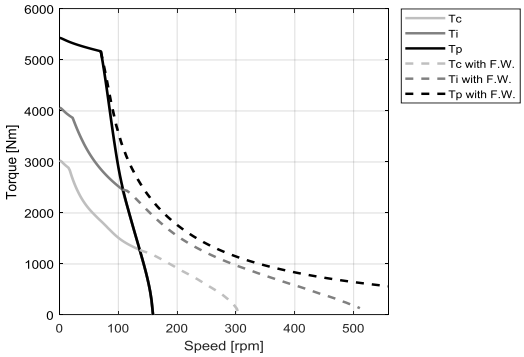

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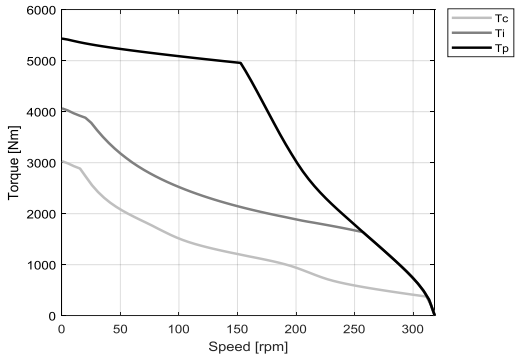
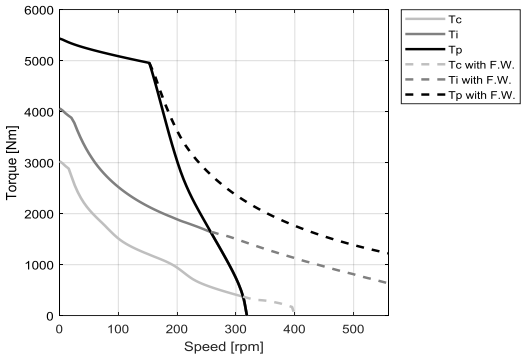


WL - WATER COOLING



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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+0760-100

MOTOR PERFORMANCE		Winding codes	WB	WD	WF	WL
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	7630	7770	7770	7770
Ti	Intermittent torque	Nm	5930	5930	5930	5930
Tc	Continuous torque	Nm	4430	4430	4430	4430
Ts	Standstill torque	Nm	3580	3580	3580	3580
Ip	Peak current	Arms	73.2	153	230	459
Ii	Intermittent current	Arms	46.5	92.9	139	279
Ic	Continuous current	Arms	29.4	58.8	88.2	176
Is	Standstill current	Arms	22.3	44.5	66.8	134
ns	Rated low speed	rpm	0.069	0.069	0.069	0.069
nm	Maximum speed without flux weakening	rpm	37.0	74.1	111	223
nm,FW	Maximum speed with flux weakening	rpm	118	180	237	352
τon,p	Maximum ON time for peak cycle	s	11	9.8	9.8	9.8
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	52700	58000	58000	58000
Pi	Power dissipation @ Ii	W	27100	27100	27100	27100
Pc	Power dissipation @ Ic	W	10800	10800	10800	10800
Td	Max. detent torque (average to peak)	Nm	21	21	21	21

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	186	93.2	62.2	31.1
Ku	Back EMF constant (*)	Vrms/(rad/s)	107	53.6	35.7	17.9
Km	Motor constant	Nm/√W	62.6	62.6	62.6	62.6
R20	Electrical resistance at 20°C (*)	Ohm	5.91	1.48	0.657	0.164
Ld/Lq	Electrical inductance (*)	mH	91.6 / 76.0	22.9 / 19.0	10.2 / 8.44	2.54 / 2.11
Isc	Maximum short-circuit current	Arms	20.5	40.9	61.4	123
nb	Base speed	rpm	17.4	55.2	92.4	207
nb,i	Base speed at intermittent duty cycle	rpm	7.17	40.9	72.3	173
nb,p	Base speed at peak duty cycle	rpm	0.00	26.5	48.0	109
nn	Rated speed	rpm	12.8	47.7	82.8	188
Tn	Rated torque	Nm	4230	2890	2250	1420
In	Rated current	Arms	29.1	36.0	41.0	53.6
τth	Thermal time constant	s	132	132	132	132
Rth	Thermal resistance	K/W	0.00955	0.00955	0.00955	0.00955
2p	Number of poles	-	132	132	132	132
J	Rotor inertia	kg·m²	3.29	3.29	3.29	3.29
mr	Rotor mass	kg	29.4	29.4	29.4	29.4
ms	Stator mass	kg	124	124	124	124

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.490	0.490	0.490	0.490
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	34	34	34	34
Δpw	Max. pressure drop at qw	bar	2.2	2.2	2.2	2.2

Notes: (*) terminal to terminal.
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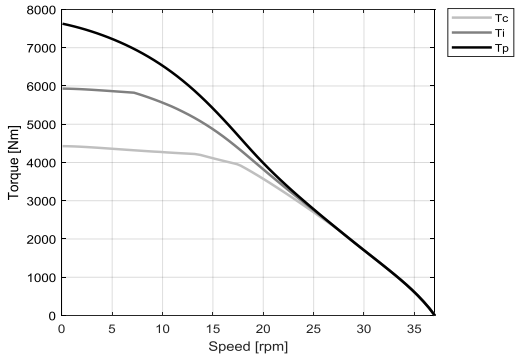
CONVENTIONAL TORQUE MOTOR TMB+0760-100

WB - WATER COOLING



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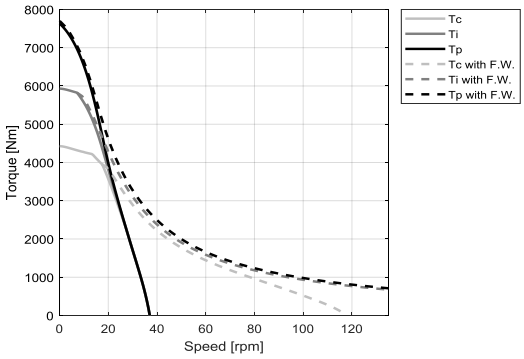

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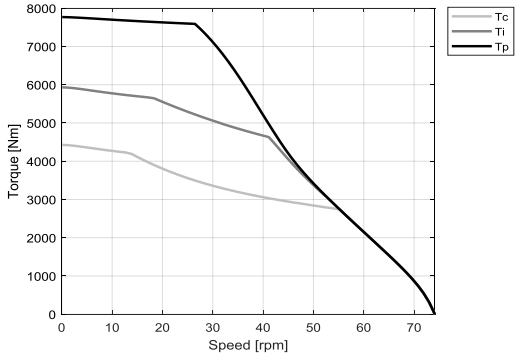

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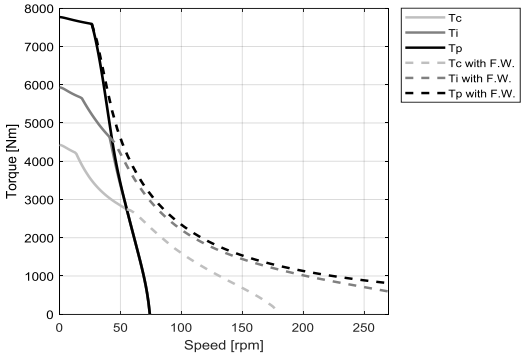

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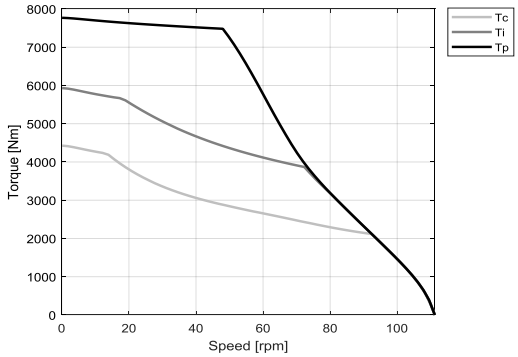

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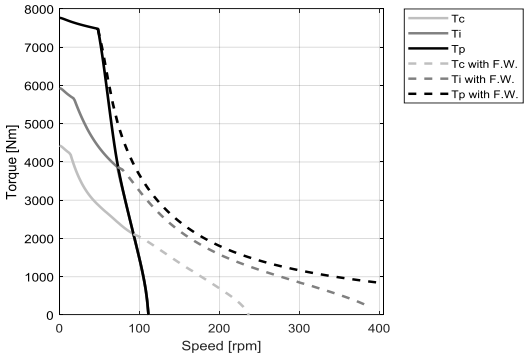

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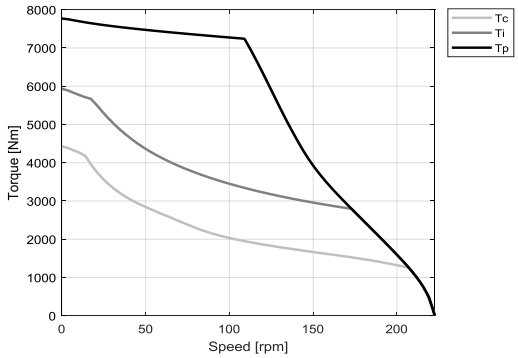
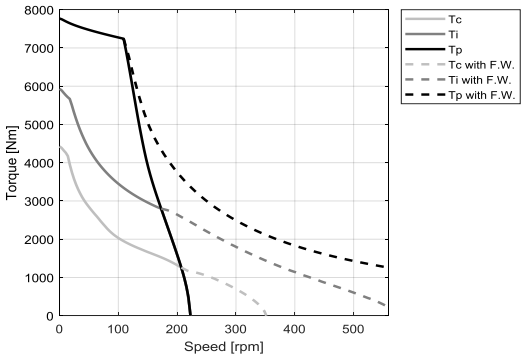


WL - WATER COOLING



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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+0760-150

MOTOR PERFORMANCE		Winding codes	UF	UL	WL	
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	
Tp	Peak torque	Nm	11600	11600	11600	
Ti	Intermittent torque	Nm	8760	8760	8920	
Tc	Continuous torque	Nm	6510	6510	6660	
Ts	Standstill torque	Nm	5250	5250	5380	
Ip	Peak current	Arms	156	312	452	
Ii	Intermittent current	Arms	92.7	185	278	
Ic	Continuous current	Arms	58.6	117	176	
Is	Standstill current	Arms	44.4	88.9	133	
ns	Rated low speed	rpm	0.070	0.070	0.068	
nm	Maximum speed without flux weakening	rpm	51.1	102	148	
nm,FW	Maximum speed with flux weakening	rpm	133	210	263	
τon,p	Maximum ON time for peak cycle	s	7.9	7.9	9.0	
τon,i	Maximum ON time for intermittent cycle	s	2.8	2.8	2.8	
Pp	Power dissipation @ Ip	W	85500	85500	80000	
Pi	Power dissipation @ Ii	W	37800	37800	38000	
Pc	Power dissipation @ Ic	W	15100	15100	15200	
Td	Max. detent torque (average to peak)	Nm	31	31	31	

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	135	67.7	46.7	
Ku	Back EMF constant (*)	Vrms/(rad/s)	77.7	38.9	26.8	
Km	Motor constant	Nm/√W	76.4	76.4	78.7	
R20	Electrical resistance at 20°C (*)	Ohm	2.09	0.523	0.234	
Ld/Lq	Electrical inductance (*)	mH	31.8 / 26.9	7.96 / 6.73	3.78 / 3.16	
Isc	Maximum short-circuit current	Arms	42.7	85.4	124	
nb	Base speed	rpm	33.8	85.5	132	
nb,i	Base speed at intermittent duty cycle	rpm	21.0	66.8	109	
nb,p	Base speed at peak duty cycle	rpm	11.4	43.2	69.8	
nn	Rated speed	rpm	28.7	76.9	121	
Tn	Rated torque	Nm	4890	3270	2640	
In	Rated current	Arms	42.6	54.4	64.4	
τth	Thermal time constant	s	130	130	133	
Rth	Thermal resistance	K/W	0.00663	0.00663	0.00661	
2p	Number of poles	-	132	132	132	
J	Rotor inertia	kg·m²	4.95	4.95	4.95	
mr	Rotor mass	kg	44.3	44.3	44.3	
ms	Stator mass	kg	167	167	169	

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	
Di	Intermittent duty cycle	%	40	40	40	
Dp	Peak duty cycle	%	5.0	5.0	5.0	
Sr	Rotor exchange surface	m²	0.690	0.690	0.690	
θamb	Ambient temperature	°C	20	20	20	
θmax	Maximum coil temperature	°C	130	130	130	
θw	Inlet water temperature	°C	20	20	20	
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	
qw	Minimum water flow for Δθw	l/min	47	47	48	
Δpw	Max. pressure drop at qw	bar	3.9	3.9	4.0	

Notes: (*) terminal to terminal.
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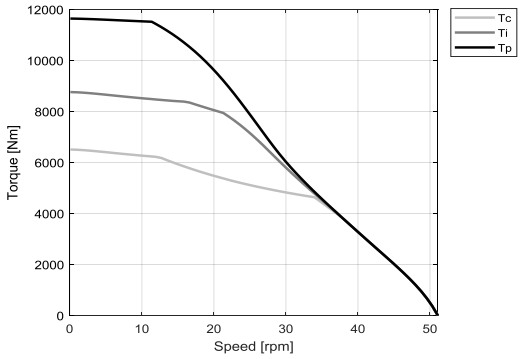
CONVENTIONAL TORQUE MOTOR TMB+0760-150

UF - WATER COOLING



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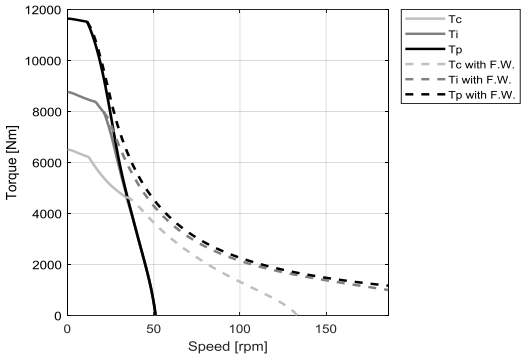

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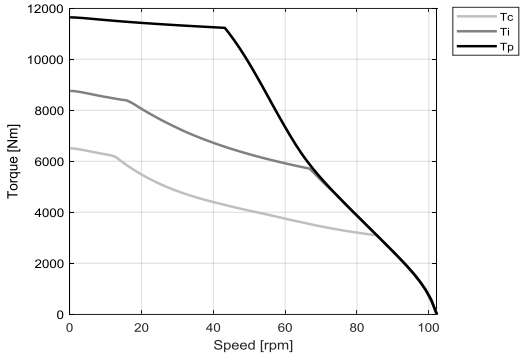

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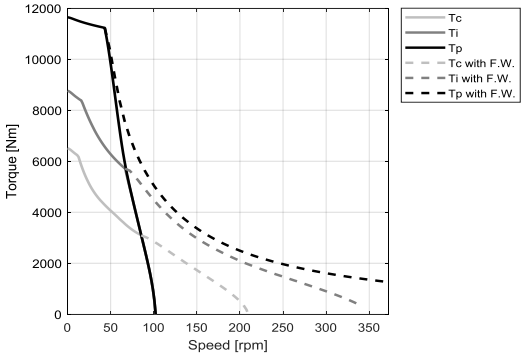
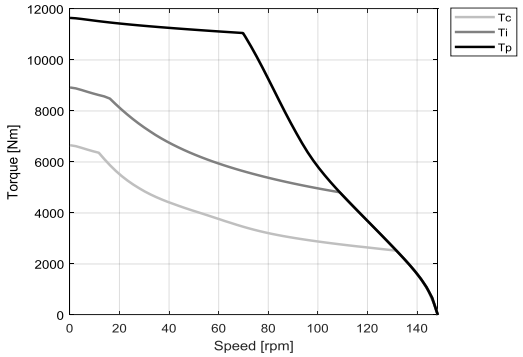
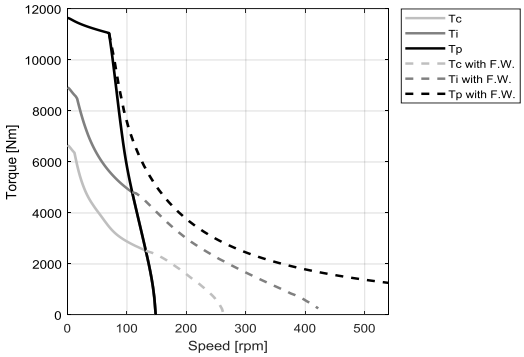


WL - WATER COOLING



WL - WATER COOLING



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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0760-200

		Winding codes	WF	WL		
MOTOR PERFORMANCE		UNIT	WATER COOLING	WATER COOLING		
Tp	Peak torque	Nm	15500	15500		
Ti	Intermittent torque	Nm	11900	11900		
Tc	Continuous torque	Nm	8840	8840		
Ts	Standstill torque	Nm	7140	7140		
Ip	Peak current	Arms	224	448		
Ii	Intermittent current	Arms	138	275		
Ic	Continuous current	Arms	87.0	174		
Is	Standstill current	Arms	65.9	132		
ns	Rated low speed	rpm	0.069	0.069		
nm	Maximum speed without flux weakening	rpm	55.6	111		
nm,FW	Maximum speed with flux weakening	rpm	135	211		
τon,p	Maximum ON time for peak cycle	s	7.8	7.8		
τon,i	Maximum ON time for intermittent cycle	s	2.8	2.8		
Pp	Power dissipation @ Ip	W	102000	102000		
Pi	Power dissipation @ Ii	W	48200	48200		
Pc	Power dissipation @ Ic	W	19300	19300		
Td	Max. detent torque (average to peak)	Nm	41	41		

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	125	62.3		
Ku	Back EMF constant (*)	Vrms/(rad/s)	71.4	35.7		
Km	Motor constant	Nm/√W	91.8	91.8		
R20	Electrical resistance at 20°C (*)	Ohm	1.23	0.306		
Ld/Lq	Electrical inductance (*)	mH	20.1 / 16.9	5.03 / 4.22		
Isc	Maximum short-circuit current	Arms	62.2	124		
nb	Base speed	rpm	40.0	96.1		
nb,i	Base speed at intermittent duty cycle	rpm	28.5	77.3		
nb,p	Base speed at peak duty cycle	rpm	16.8	49.8		
nn	Rated speed	rpm	34.5	87.6		
Tn	Rated torque	Nm	5970	3890		
In	Rated current	Arms	55.3	70.5		
τth	Thermal time constant	s	131	131		
Rth	Thermal resistance	K/W	0.00500	0.00500		
2p	Number of poles	-	132	132		
J	Rotor inertia	kg·m²	6.64	6.64		
mr	Rotor mass	kg	59.5	59.5		
ms	Stator mass	kg	211	211		

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600		
Di	Intermittent duty cycle	%	40	40		
Dp	Peak duty cycle	%	5.0	5.0		
Sr	Rotor exchange surface	m²	0.880	0.880		
θamb	Ambient temperature	°C	20	20		
θmax	Maximum coil temperature	°C	130	130		
θw	Inlet water temperature	°C	20	20		
Δθw	Water temperature difference for Pc	K	5.0	5.0		
qw	Minimum water flow for Δθw	l/min	60	60		
Δpw	Max. pressure drop at qw	bar	6.2	6.2		

Notes: (*) terminal to terminal.
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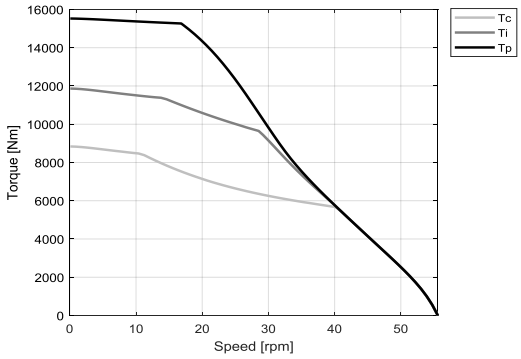
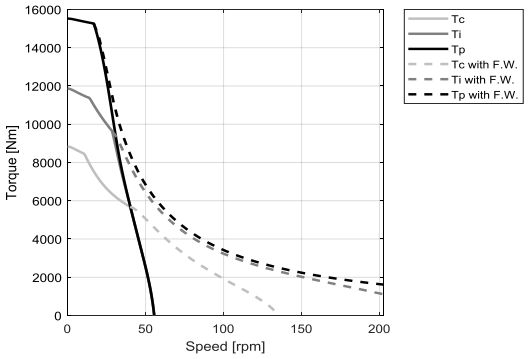
CONVENTIONAL TORQUE MOTOR TMB+0760-200

WF - WATER COOLING



WF - WATER COOLING



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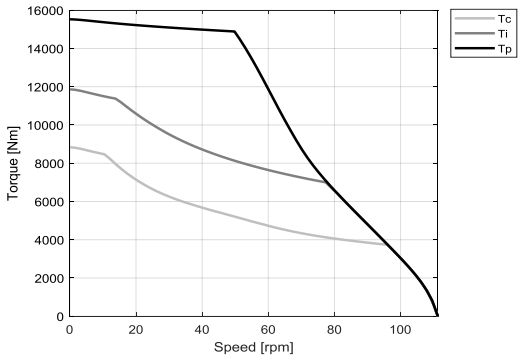

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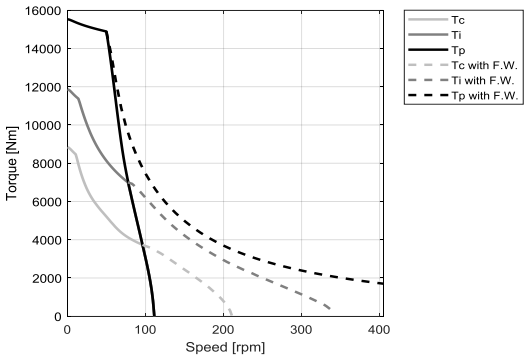

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0990-050

MOTOR PERFORMANCE		Winding codes	WB	WD	WH	WP
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	6890	6890	6890	6890
Ti	Intermittent torque	Nm	4900	4900	4900	4900
Tc	Continuous torque	Nm	3650	3650	3650	3650
Ts	Standstill torque	Nm	2950	2950	2950	2950
Ip	Peak current	Arms	87.1	174	348	697
Ii	Intermittent current	Arms	44.4	88.8	178	355
Ic	Continuous current	Arms	28.1	56.1	112	225
Is	Standstill current	Arms	21.3	42.5	85.1	170
ns	Rated low speed	rpm	0.047	0.047	0.047	0.047
nm	Maximum speed without flux weakening	rpm	42.8	85.6	171	343
nm,FW	Maximum speed with flux weakening	rpm	156	245	332	415
τon,p	Maximum ON time for peak cycle	s	6.6	6.6	6.6	6.6
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	61800	61800	61800	61800
Pi	Power dissipation @ Ii	W	19500	19500	19500	19500
Pc	Power dissipation @ Ic	W	7790	7790	7790	7790
Td	Max. detent torque (average to peak)	Nm	18	18	18	18

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	161	80.6	40.3	20.1
Ku	Back EMF constant (*)	Vrms/(rad/s)	92.8	46.4	23.2	11.6
Km	Motor constant	Nm/√W	61.1	61.1	61.1	61.1
R20	Electrical resistance at 20°C (*)	Ohm	4.63	1.16	0.289	0.0723
Ld/Lq	Electrical inductance (*)	mH	67.9 / 56.8	17.0 / 14.2	4.24 / 3.55	1.06 / 0.888
Isc	Maximum short-circuit current	Arms	17.9	35.9	71.7	143
nb	Base speed	rpm	21.3	58.7	144	336
nb,i	Base speed at intermittent duty cycle	rpm	13.8	43.9	109	266
nb,p	Base speed at peak duty cycle	rpm	0.809	28.9	71.3	152
nn	Rated speed	rpm	17.5	51.0	130	200
Tn	Rated torque	Nm	3430	2630	1680	1260
In	Rated current	Arms	27.5	39.3	48.5	75.0
τth	Thermal time constant	s	146	146	146	146
Rth	Thermal resistance	K/W	0.0136	0.0136	0.0136	0.0136
2p	Number of poles	-	176	176	176	176
J	Rotor inertia	kg·m²	4.94	4.94	4.94	4.94
mr	Rotor mass	kg	24.8	24.8	24.8	24.8
ms	Stator mass	kg	115	115	115	115

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.410	0.410	0.410	0.410
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	24	24	24	24
Δpw	Max. pressure drop at qw	bar	1.1	1.1	1.1	1.1

Notes: (*) terminal to terminal.
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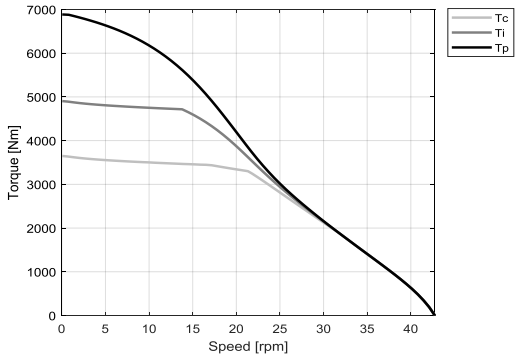
CONVENTIONAL TORQUE MOTOR TMB+0990-050

WB - WATER COOLING



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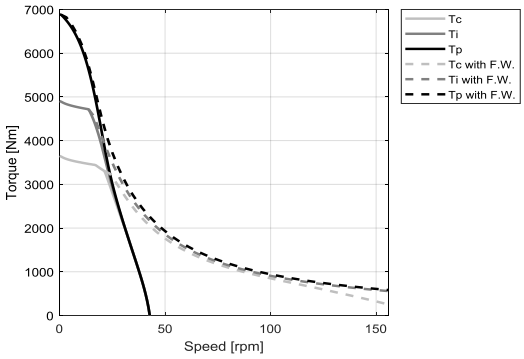

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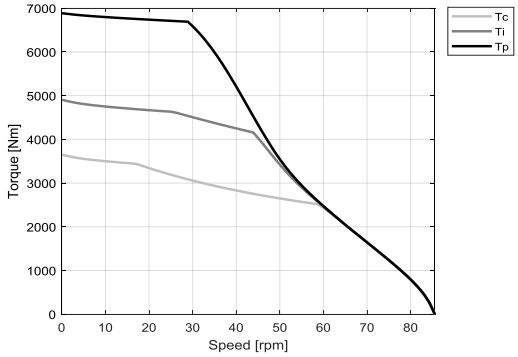

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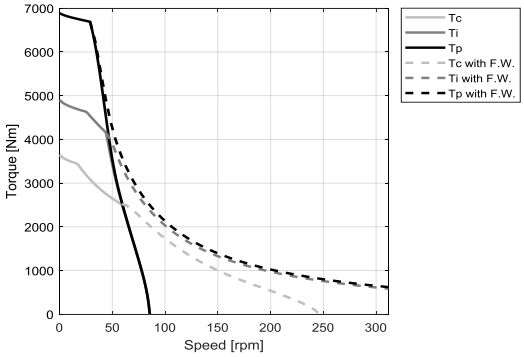
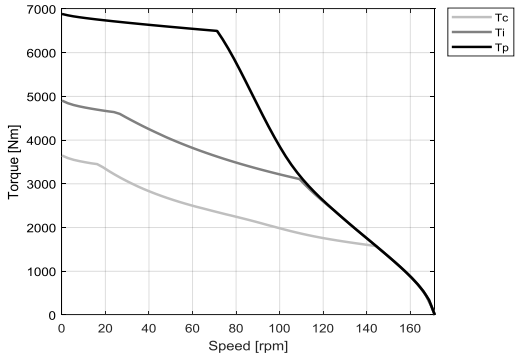


WH - WATER COOLING



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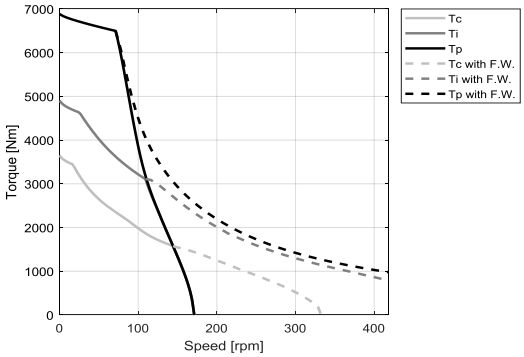

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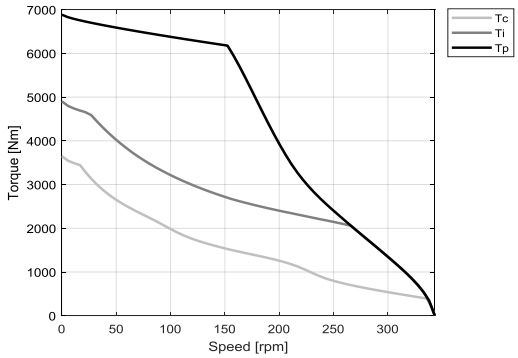

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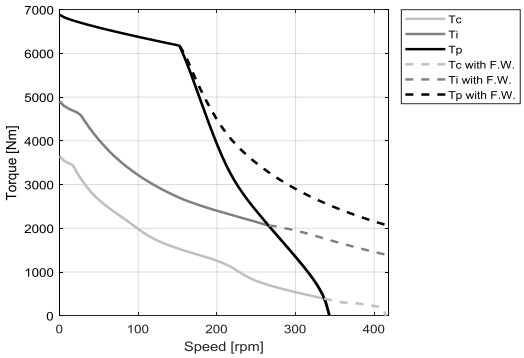

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0990-070

MOTOR PERFORMANCE		Winding codes	WB	WD	WH	WP
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	9120	9650	9650	9650
Ti	Intermittent torque	Nm	7030	7030	7030	7030
Tc	Continuous torque	Nm	5230	5230	5230	5230
Ts	Standstill torque	Nm	4230	4230	4230	4230
Ip	Peak current	Arms	72.8	167	335	670
Ii	Intermittent current	Arms	45.2	90.5	181	362
Ic	Continuous current	Arms	28.6	57.2	114	229
Is	Standstill current	Arms	21.7	43.3	86.7	173
ns	Rated low speed	rpm	0.047	0.047	0.047	0.047
nm	Maximum speed without flux weakening	rpm	30.5	61.1	122	245
nm,FW	Maximum speed with flux weakening	rpm	111	165	238	315
τon,p	Maximum ON time for peak cycle	s	12	7.5	7.5	7.5
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	52300	71700	71700	71700
Pi	Power dissipation @ Ii	W	25800	25800	25800	25800
Pc	Power dissipation @ Ic	W	10300	10300	10300	10300
Td	Max. detent torque (average to peak)	Nm	26	26	26	26

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	226	113	56.5	28.2
Ku	Back EMF constant (*)	Vrms/(rad/s)	130	65.0	32.5	16.2
Km	Motor constant	Nm/√W	75.8	75.8	75.8	75.8
R20	Electrical resistance at 20°C (*)	Ohm	5.92	1.48	0.370	0.0924
Ld/Lq	Electrical inductance (*)	mH	90.0 / 75.4	22.5 / 18.8	5.63 / 4.71	1.41 / 1.18
Isc	Maximum short-circuit current	Arms	18.9	37.9	75.8	152
nb	Base speed	rpm	13.9	42.2	104	240
nb,i	Base speed at intermittent duty cycle	rpm	6.24	30.8	79.6	194
nb,p	Base speed at peak duty cycle	rpm	0.00	18.7	51.4	113
nn	Rated speed	rpm	10.5	36.6	93.7	143
Tn	Rated torque	Nm	4950	3700	2390	1830
In	Rated current	Arms	28.2	38.8	48.5	76.1
τth	Thermal time constant	s	144	144	144	144
Rth	Thermal resistance	K/W	0.0102	0.0102	0.0102	0.0102
2p	Number of poles	-	176	176	176	176
J	Rotor inertia	kg·m²	6.96	6.96	6.96	6.96
mr	Rotor mass	kg	34.9	34.9	34.9	34.9
ms	Stator mass	kg	139	139	139	139

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.520	0.520	0.520	0.520
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	32	32	32	32
Δpw	Max. pressure drop at qw	bar	1.6	1.6	1.6	1.6

Notes: (*) terminal to terminal.
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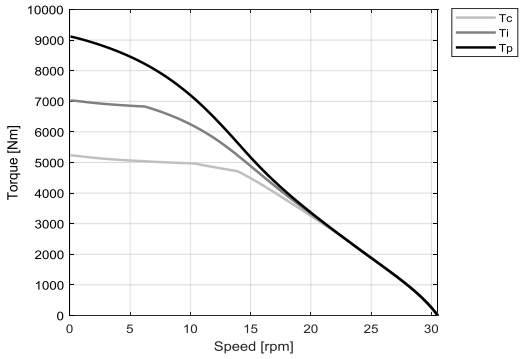
CONVENTIONAL TORQUE MOTOR TMB+0990-070

WB - WATER COOLING



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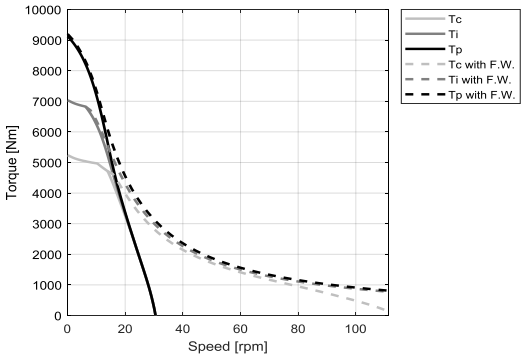

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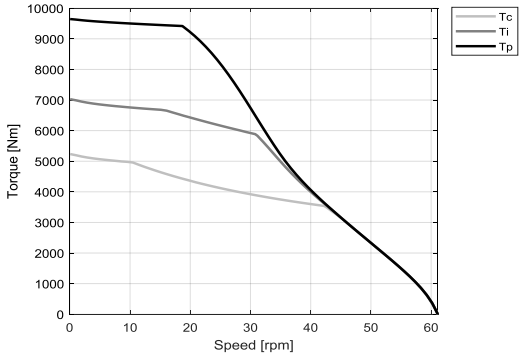

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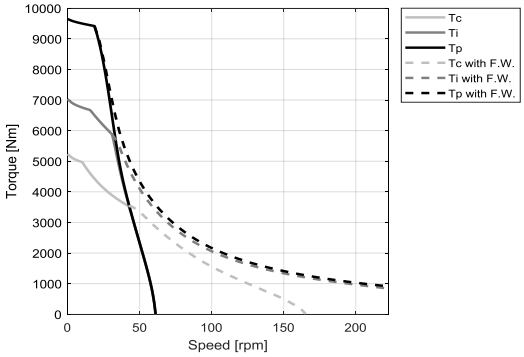
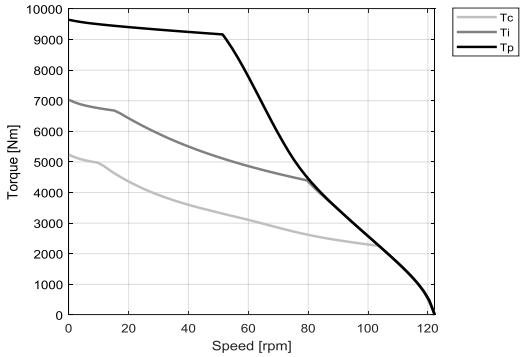


WH - WATER COOLING



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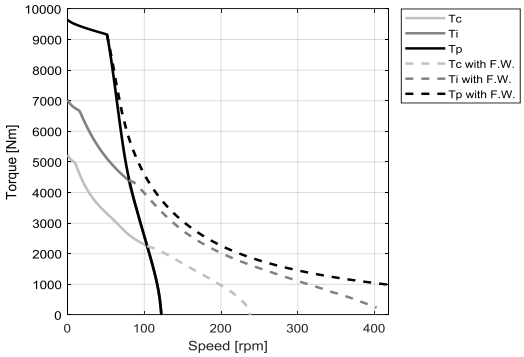

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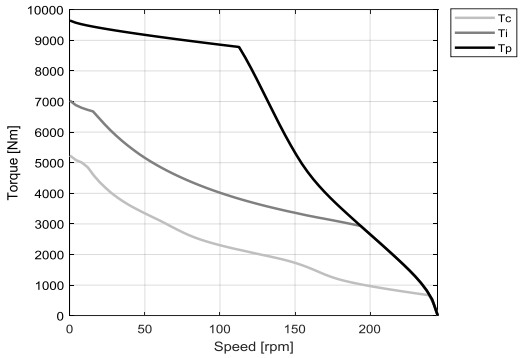

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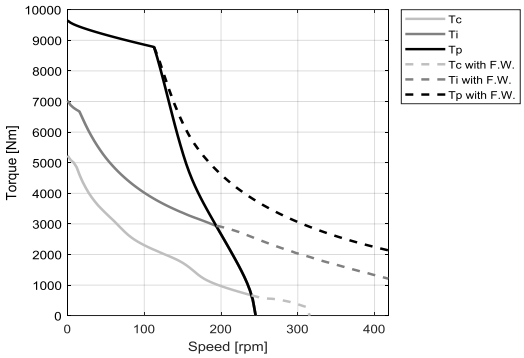

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CONVENTIONAL TORQUE MOTOR TMB+0990-100

MOTOR PERFORMANCE		Winding codes	UD	WD	WH	WP
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	13000	13800	13800	13800
Ti	Intermittent torque	Nm	9980	10200	10200	10200
Tc	Continuous torque	Nm	7410	7570	7570	7570
Ts	Standstill torque	Nm	5970	6120	6120	6120
Ip	Peak current	Arms	97.7	164	328	656
Ii	Intermittent current	Arms	61.0	91.2	182	365
Ic	Continuous current	Arms	38.6	57.7	115	231
Is	Standstill current	Arms	29.2	43.7	87.4	175
ns	Rated low speed	rpm	0.046	0.046	0.046	0.046
nm	Maximum speed without flux weakening	rpm	29.5	42.8	85.7	172
nm,FW	Maximum speed with flux weakening	rpm	94.7	118	183	268
τon,p	Maximum ON time for peak cycle	s	10	7.5	7.5	7.5
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	70200	91300	91300	91300
Pi	Power dissipation @ Ii	W	34600	34800	34800	34800
Pc	Power dissipation @ Ic	W	13800	13900	13900	13900
Td	Max. detent torque (average to peak)	Nm	37	37	37	37

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	234	162	80.8	40.4
Ku	Back EMF constant (*)	Vrms/(rad/s)	135	92.8	46.4	23.2
Km	Motor constant	Nm/√W	91.4	94.0	94.0	94.0
R20	Electrical resistance at 20°C (*)	Ohm	4.39	1.97	0.492	0.123
Ld/Lq	Electrical inductance (*)	mH	64.3 / 54.7	30.6 / 25.6	7.64 / 6.41	1.91 / 1.60
Isc	Maximum short-circuit current	Arms	27.5	39.8	79.7	159
nb	Base speed	rpm	14.9	28.2	70.5	160
nb,i	Base speed at intermittent duty cycle	rpm	6.21	18.9	54.2	131
nb,p	Base speed at peak duty cycle	rpm	0.00	9.01	34.7	80.1
nn	Rated speed	rpm	11.7	24.1	62.9	140
Tn	Rated torque	Nm	6620	5620	3930	2490
In	Rated current	Arms	35.1	41.2	55.1	72.0
τth	Thermal time constant	s	147	150	150	150
Rth	Thermal resistance	K/W	0.00731	0.00728	0.00728	0.00728
2p	Number of poles	-	176	176	176	176
J	Rotor inertia	kg·m²	9.99	9.99	9.99	9.99
mr	Rotor mass	kg	50.1	50.1	50.1	50.1
ms	Stator mass	kg	172	174	174	174

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.680	0.680	0.680	0.680
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	10	10	10	10
qw	Minimum water flow for Δθw	l/min	22	22	22	22
Δpw	Max. pressure drop at qw	bar	0.9	0.9	0.9	0.9

Notes: (*) terminal to terminal.
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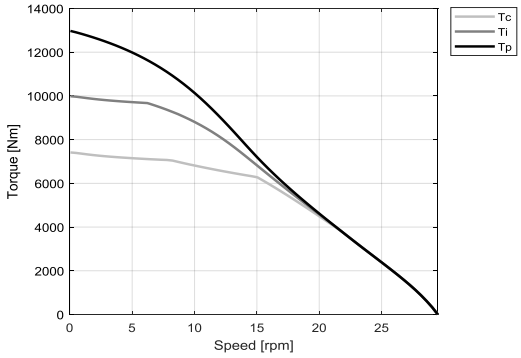
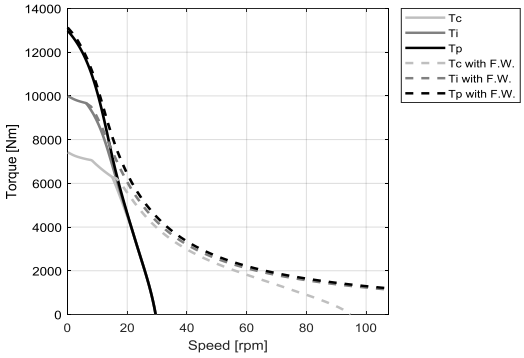
CONVENTIONAL TORQUE MOTOR TMB+0990-100

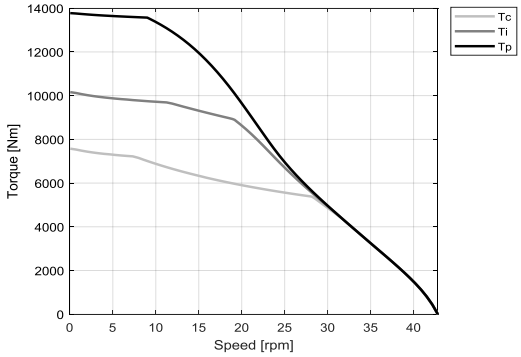
UD - WATER COOLING



UD - WATER COOLING



WD - WATER COOLING



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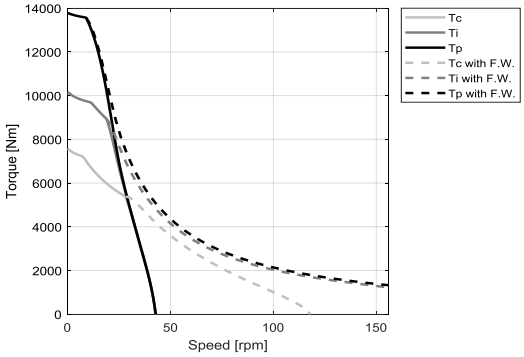
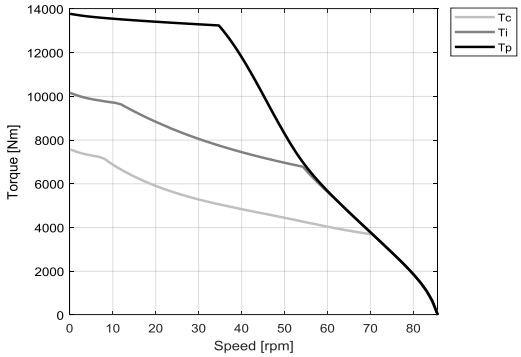


WH - WATER COOLING



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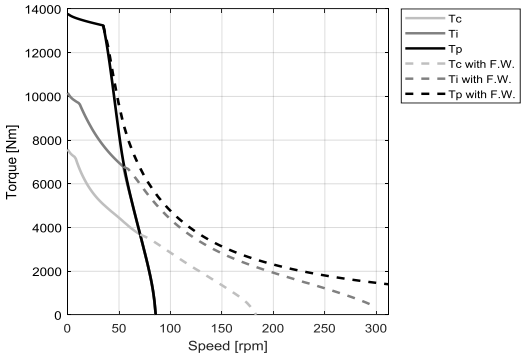

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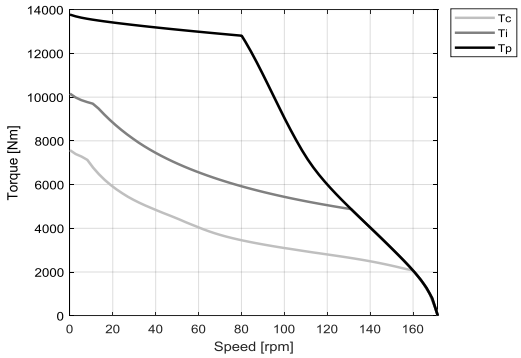

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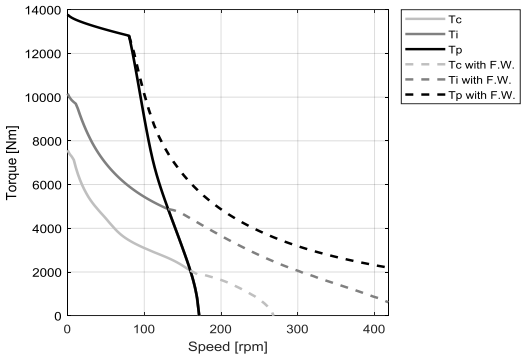

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0990-150

MOTOR PERFORMANCE		Winding codes	WD	WH	UP	WP
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	20200	20700	20600	20700
Ti	Intermittent torque	Nm	15300	15300	15000	15300
Tc	Continuous torque	Nm	11400	11400	11100	11400
Ts	Standstill torque	Nm	9200	9200	8970	9200
Ip	Peak current	Arms	152	321	442	641
Ii	Intermittent current	Arms	90.8	182	243	363
Ic	Continuous current	Arms	57.4	115	153	230
Is	Standstill current	Arms	43.5	87.0	116	174
ns	Rated low speed	rpm	0.045	0.045	0.046	0.045
nm	Maximum speed without flux weakening	rpm	28.5	57.1	78.8	114
nm,FW	Maximum speed with flux weakening	rpm	86.7	133	163	201
τon,p	Maximum ON time for peak cycle	s	8.4	7.0	6.1	7.0
τon,i	Maximum ON time for intermittent cycle	s	2.8	2.8	2.8	2.8
Pp	Power dissipation @ Ip	W	109000	124000	132000	124000
Pi	Power dissipation @ Ii	W	48800	48800	48500	48800
Pc	Power dissipation @ Ic	W	19500	19500	19400	19500
Td	Max. detent torque (average to peak)	Nm	55	55	55	55

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	243	121	88.0	60.6
Ku	Back EMF constant (*)	Vrms/(rad/s)	139	69.6	50.5	34.8
Km	Motor constant	Nm/√W	118	118	115	118
R20	Electrical resistance at 20°C (*)	Ohm	2.81	0.702	0.392	0.176
Ld/Lq	Electrical inductance (*)	mH	45.4 / 38.3	11.4 / 9.58	5.97 / 5.11	2.84 / 2.40
Isc	Maximum short-circuit current	Arms	40.2	80.4	111	161
nb	Base speed	rpm	15.9	43.4	65.3	101
nb,i	Base speed at intermittent duty cycle	rpm	6.96	32.7	50.1	81.8
nb,p	Base speed at peak duty cycle	rpm	0.00	19.7	31.2	51.3
nn	Rated speed	rpm	13.0	37.8	58.4	92.5
Tn	Rated torque	Nm	9500	7080	5710	4570
In	Rated current	Arms	47.5	66.6	73.1	85.9
τth	Thermal time constant	s	152	152	149	152
Rth	Thermal resistance	K/W	0.00504	0.00504	0.00506	0.00504
2p	Number of poles	-	176	176	176	176
J	Rotor inertia	kg·m²	14.9	14.9	14.9	14.9
mr	Rotor mass	kg	74.4	74.4	74.4	74.4
ms	Stator mass	kg	235	235	233	235

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.950	0.950	0.950	0.950
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	10	10	10	10
qw	Minimum water flow for Δθw	l/min	30	30	30	30
Δpw	Max. pressure drop at qw	bar	1.7	1.7	1.7	1.7

Notes: (*) terminal to terminal.
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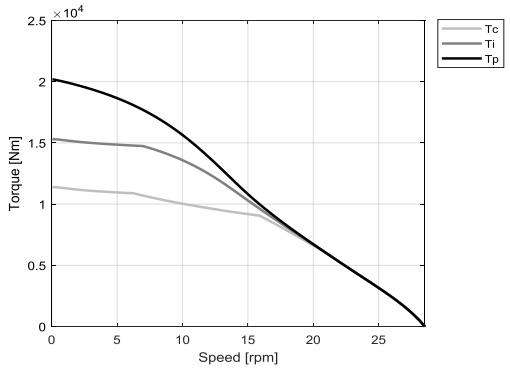
CONVENTIONAL TORQUE MOTOR TMB+0990-150

WD - WATER COOLING



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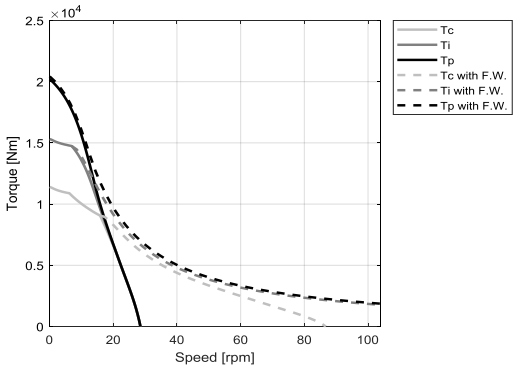

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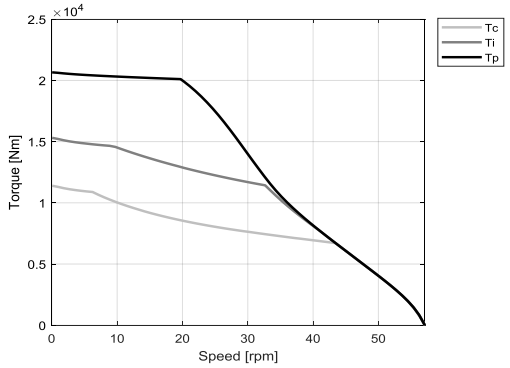

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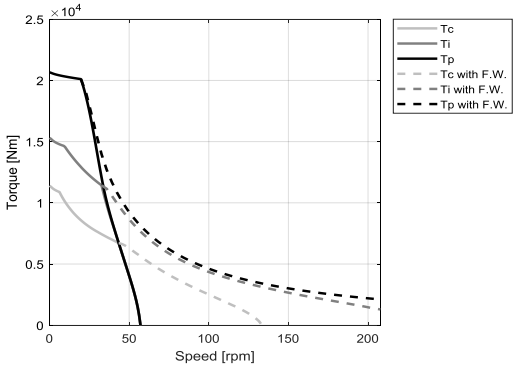
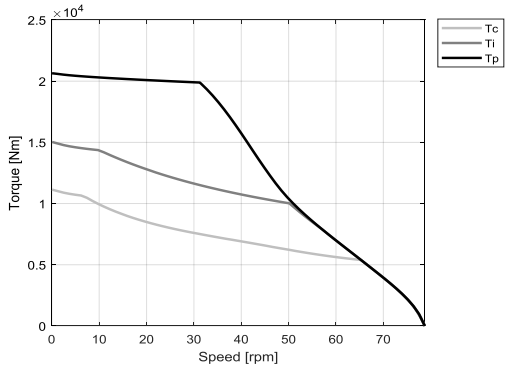
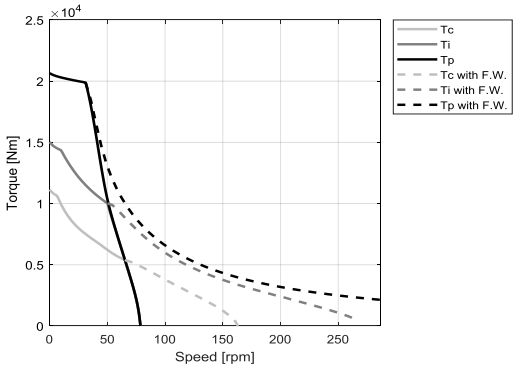


UP - WATER COOLING



UP - WATER COOLING



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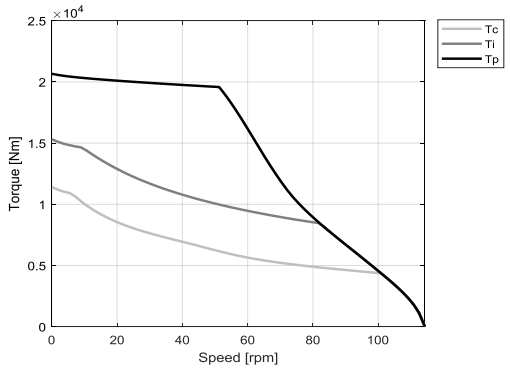

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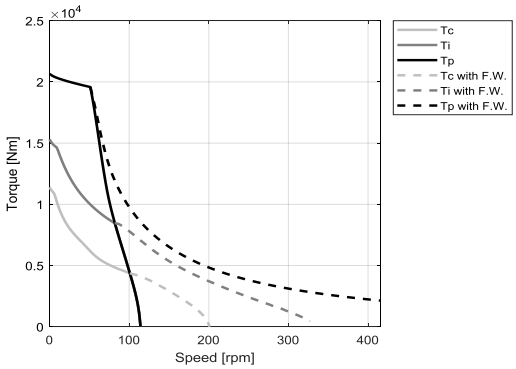

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TMB Standard

CONVENTIONAL TORQUE MOTOR TMB+0990-200

MOTOR PERFORMANCE		Winding codes	WH	UP	WP	
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	
Tp	Peak torque	Nm	27500	27500	27500	
Ti	Intermittent torque	Nm	20400	20000	20400	
Tc	Continuous torque	Nm	15100	14800	15100	
Ts	Standstill torque	Nm	12200	11900	12200	
Ip	Peak current	Arms	317	437	634	
Ii	Intermittent current	Arms	180	240	360	
Ic	Continuous current	Arms	114	152	227	
Is	Standstill current	Arms	86.2	115	172	
ns	Rated low speed	rpm	0.045	0.046	0.045	
nm	Maximum speed without flux weakening	rpm	42.8	59.1	85.7	
nm,FW	Maximum speed with flux weakening	rpm	106	130	163	
τon,p	Maximum ON time for peak cycle	s	6.0	5.2	6.0	
τon,i	Maximum ON time for intermittent cycle	s	2.8	2.8	2.8	
Pp	Power dissipation @ Ip	W	157000	169000	157000	
Pi	Power dissipation @ Ii	W	61900	61500	61900	
Pc	Power dissipation @ Ic	W	24800	24600	24800	
Td	Max. detent torque (average to peak)	Nm	73	73	73	

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	162	117	80.9	
Ku	Back EMF constant (*)	Vrms/(rad/s)	92.8	67.3	46.4	
Km	Motor constant	Nm/√W	138	134	138	
R20	Electrical resistance at 20°C (*)	Ohm	0.919	0.514	0.230	
Ld/Lq	Electrical inductance (*)	mH	15.1 / 12.8	7.93 / 6.83	3.77 / 3.20	
Isc	Maximum short-circuit current	Arms	80.8	111	162	
nb	Base speed	rpm	30.6	46.6	73.5	
nb,i	Base speed at intermittent duty cycle	rpm	22.0	35.0	57.9	
nb,p	Base speed at peak duty cycle	rpm	11.3	20.4	36.3	
nn	Rated speed	rpm	26.3	40.8	66.9	
Tn	Rated torque	Nm	10200	8690	6770	
In	Rated current	Arms	72.5	83.4	94.3	
τth	Thermal time constant	s	151	148	151	
Rth	Thermal resistance	K/W	0.00382	0.00383	0.00382	
2p	Number of poles	-	176	176	176	
J	Rotor inertia	kg·m²	20.0	20.0	20.0	
mr	Rotor mass	kg	100	100	100	
ms	Stator mass	kg	294	291	294	

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	
Di	Intermittent duty cycle	%	40	40	40	
Dp	Peak duty cycle	%	5.0	5.0	5.0	
Sr	Rotor exchange surface	m²	1.200	1.200	1.200	
θamb	Ambient temperature	°C	20	20	20	
θmax	Maximum coil temperature	°C	130	130	130	
θw	Inlet water temperature	°C	20	20	20	
Δθw	Water temperature difference for Pc	K	10	10	10	
qw	Minimum water flow for Δθw	l/min	39	38	39	
Δpw	Max. pressure drop at qw	bar	2.6	2.5	2.6	

Notes: (*) terminal to terminal.
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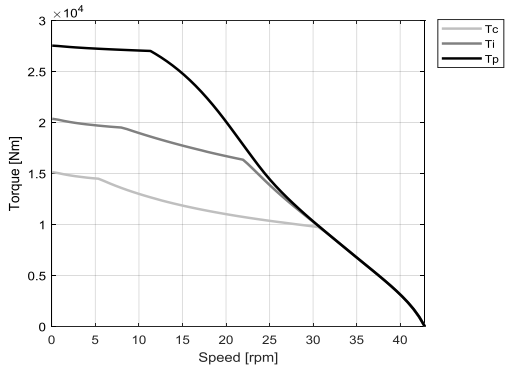
CONVENTIONAL TORQUE MOTOR TMB+0990-200

WH - WATER COOLING



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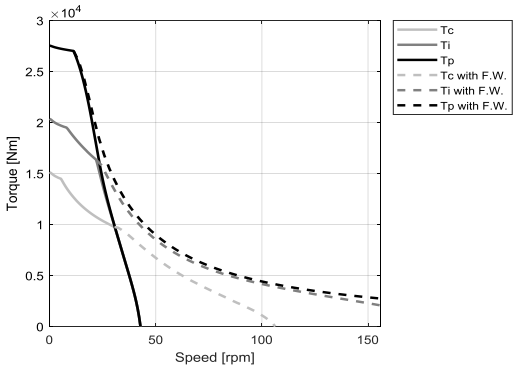
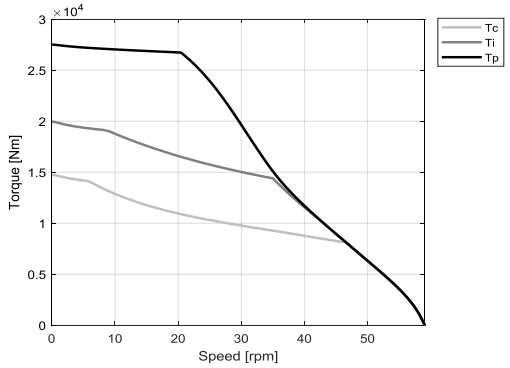


UP - WATER COOLING



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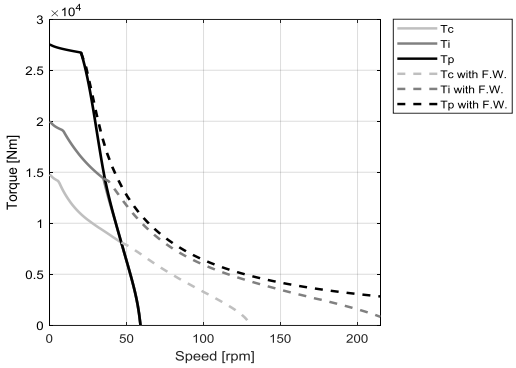

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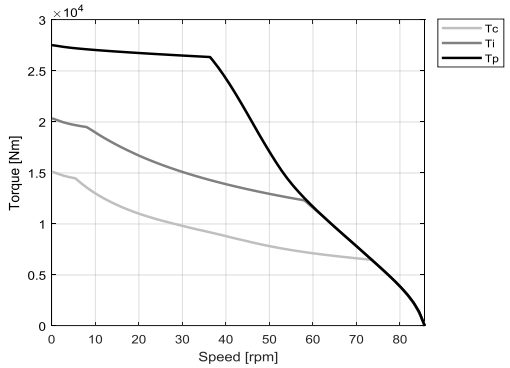

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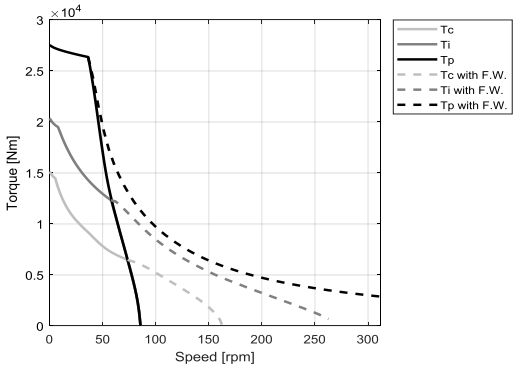

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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+1221-050

MOTOR PERFORMANCE		Winding codes	WB	WD	UJ	WT
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	9840	10500	10500	10500
Ti	Intermittent torque	Nm	7440	7440	7310	7440
Tc	Continuous torque	Nm	5530	5530	5410	5530
Ts	Standstill torque	Nm	4460	4460	4350	4460
Ip	Peak current	Arms	73.7	173	298	865
Ii	Intermittent current	Arms	43.8	87.6	146	438
Ic	Continuous current	Arms	27.7	55.4	92.6	277
Is	Standstill current	Arms	21.0	42.0	70.2	210
ns	Rated low speed	rpm	0.032	0.032	0.032	0.032
nm	Maximum speed without flux weakening	rpm	28.1	56.2	96.8	282
nm,FW	Maximum speed with flux weakening	rpm	102	199	261	334
τon,p	Maximum ON time for peak cycle	s	11	6.5	5.7	6.5
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	53000	76400	81200	76400
Pi	Power dissipation @ Ii	W	23700	23700	23500	23700
Pc	Power dissipation @ Ic	W	9490	9490	9380	9490
Td	Max. detent torque (average to peak)	Nm	27	27	27	27

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	245	123	71.2	24.5
Ku	Back EMF constant (*)	Vrms/(rad/s)	141	70.7	41.0	14.1
Km	Motor constant	Nm/√W	83.3	83.3	81.2	83.3
R20	Electrical resistance at 20°C (*)	Ohm	5.79	1.45	0.512	0.0579
Ld/Lq	Electrical inductance (*)	mH	85.1 / 71.7	21.3 / 17.9	7.16 / 6.12	0.851 / 0.717
Isc	Maximum short-circuit current	Arms	17.4	34.9	60.1	174
nb	Base speed	rpm	11.7	33.5	69.5	274
nb,i	Base speed at intermittent duty cycle	rpm	6.32	24.3	52.4	206
nb,p	Base speed at peak duty cycle	rpm	0.00	15.9	36.0	123
nn	Rated speed	rpm	9.68	28.8	60.5	177
Tn	Rated torque	Nm	5340	4700	3720	1970
In	Rated current	Arms	27.5	47.9	62.0	96.8
τth	Thermal time constant	s	172	172	169	172
Rth	Thermal resistance	K/W	0.0112	0.0112	0.0113	0.0112
2p	Number of poles	-	220	220	220	220
J	Rotor inertia	kg·m²	17.0	17.0	17.0	17.0
mr	Rotor mass	kg	55.5	55.5	55.5	55.5
ms	Stator mass	kg	203	203	202	203

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.600	0.600	0.600	0.600
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	30	30	29	30
Δpw	Max. pressure drop at qw	bar	1.5	1.5	1.4	1.5

Notes: (*) terminal to terminal.
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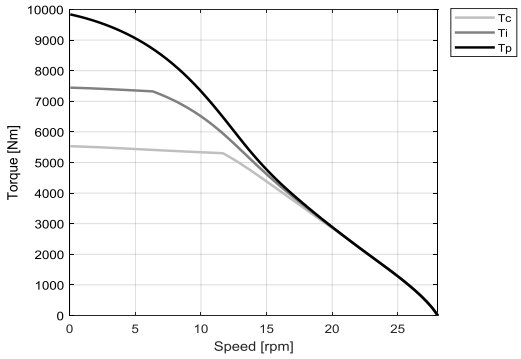
CONVENTIONAL TORQUE MOTOR TMB+1221-050

WB - WATER COOLING



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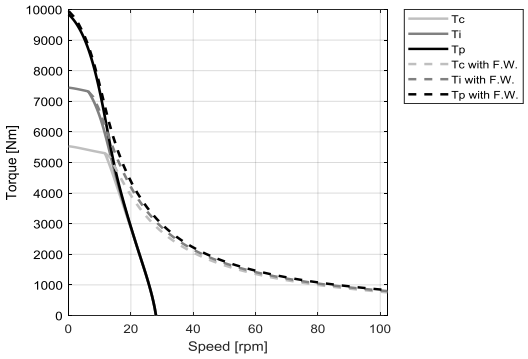
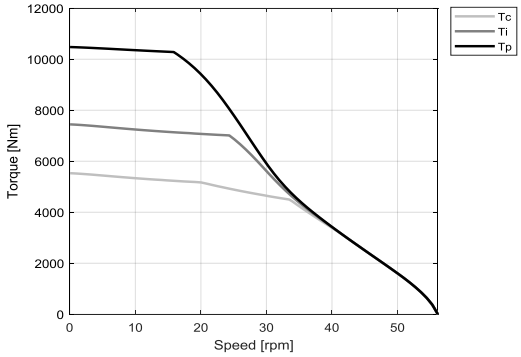


WD - WATER COOLING



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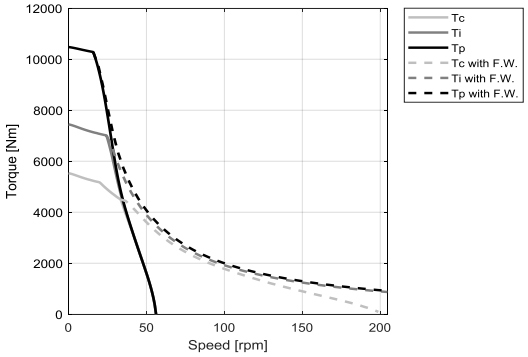
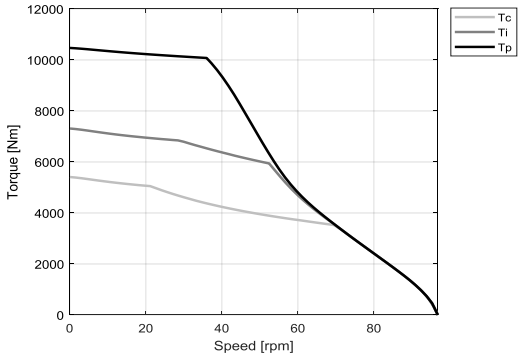


UJ - WATER COOLING



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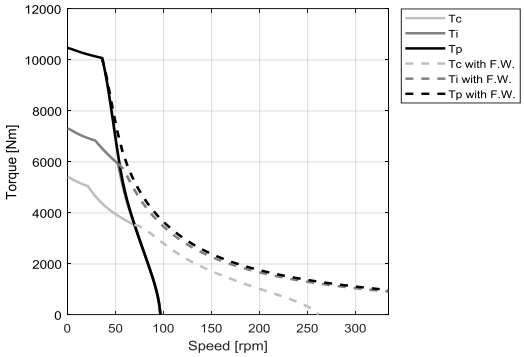

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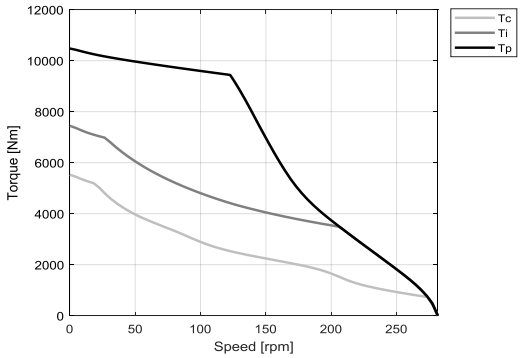
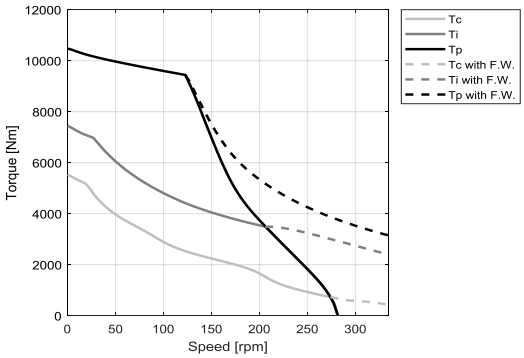


WT - WATER COOLING



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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+1221-070

MOTOR PERFORMANCE		Winding codes	UD	WE	WJ	WT
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	14000	14900	14900	14900
Ti	Intermittent torque	Nm	10300	10500	10500	10500
Tc	Continuous torque	Nm	7580	7730	7730	7730
Ts	Standstill torque	Nm	6080	6220	6220	6220
Ip	Peak current	Arms	103	216	432	865
Ii	Intermittent current	Arms	57.7	108	216	431
Ic	Continuous current	Arms	36.5	68.2	136	273
Is	Standstill current	Arms	27.7	51.6	103	207
ns	Rated low speed	rpm	0.031	0.031	0.031	0.031
nm	Maximum speed without flux weakening	rpm	27.6	50.1	100	201
nm,FW	Maximum speed with flux weakening	rpm	101	147	213	270
τon,p	Maximum ON time for peak cycle	s	9.2	6.2	6.2	6.2
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	73800	98100	98100	98100
Pi	Power dissipation @ Ii	W	29200	29300	29300	29300
Pc	Power dissipation @ Ic	W	11700	11700	11700	11700
Td	Max. detent torque (average to peak)	Nm	38	38	38	38

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	250	138	68.8	34.4
Ku	Back EMF constant (*)	Vrms/(rad/s)	144	79.2	39.6	19.8
Km	Motor constant	Nm/√W	101	103	103	103
R20	Electrical resistance at 20°C (*)	Ohm	4.11	1.18	0.296	0.0740
Ld/Lq	Electrical inductance (*)	mH	59.3 / 51.4	18.0 / 15.5	4.51 / 3.86	1.13 / 0.966
Isc	Maximum short-circuit current	Arms	25.4	46.1	92.2	184
nb	Base speed	rpm	12.4	33.1	82.8	195
nb,i	Base speed at intermittent duty cycle	rpm	7.33	23.6	62.2	152
nb,p	Base speed at peak duty cycle	rpm	0.00	14.1	40.5	89.4
nn	Rated speed	rpm	10.4	28.4	74.0	130
Tn	Rated torque	Nm	7250	5940	3920	2740
In	Rated current	Arms	36.1	51.6	65.3	93.9
τth	Thermal time constant	s	174	178	178	178
Rth	Thermal resistance	K/W	0.00901	0.00898	0.00898	0.00898
2p	Number of poles	-	220	220	220	220
J	Rotor inertia	kg·m²	23.4	23.4	23.4	23.4
mr	Rotor mass	kg	76.2	76.2	76.2	76.2
ms	Stator mass	kg	242	243	243	243

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.740	0.740	0.740	0.740
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	5.0	5.0	5.0	5.0
qw	Minimum water flow for Δθw	l/min	36	37	37	37
Δpw	Max. pressure drop at qw	bar	1.9	1.9	1.9	1.9

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
Please refer to ETEL Integration Manual for the mass of the optional cooling jacket and the possible additional pressure drop.

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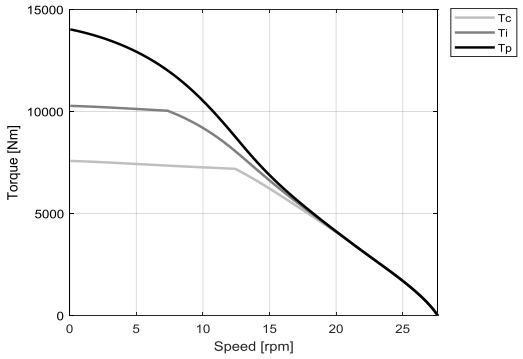
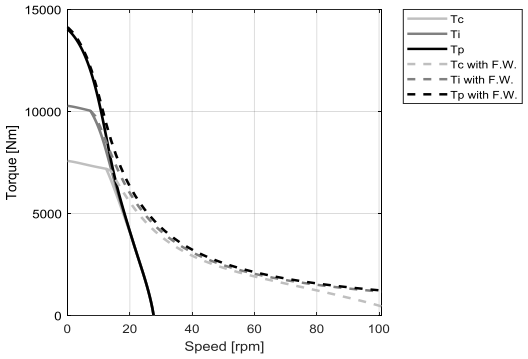
CONVENTIONAL TORQUE MOTOR TMB+1221-070

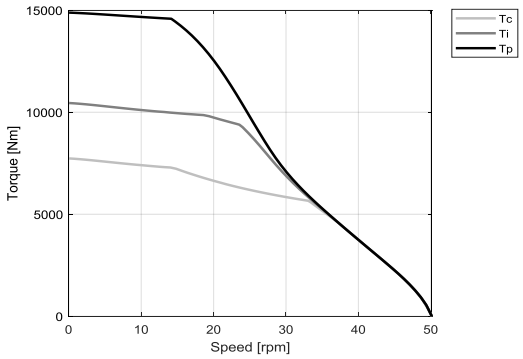
UD - WATER COOLING



UD - WATER COOLING



WE - WATER COOLING



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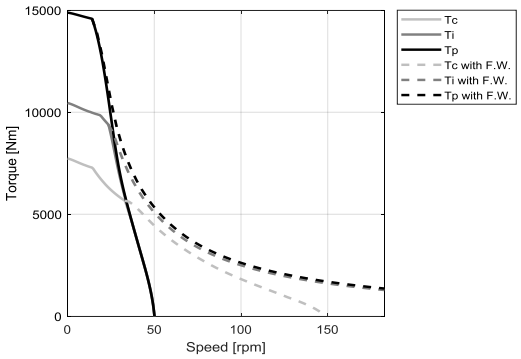
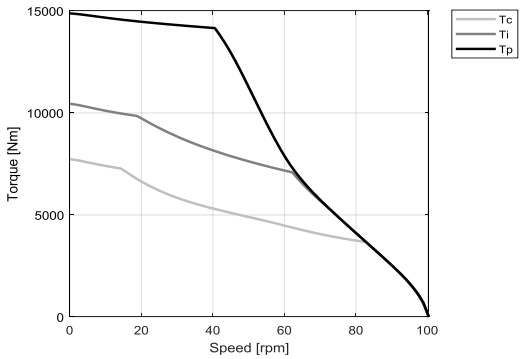


WJ - WATER COOLING



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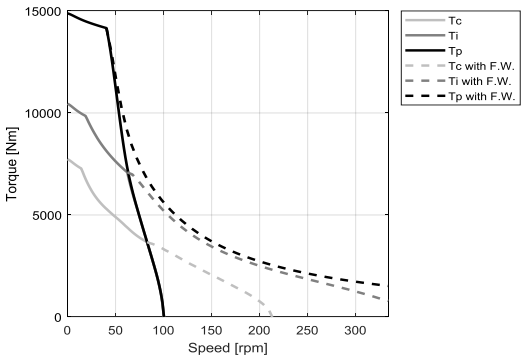

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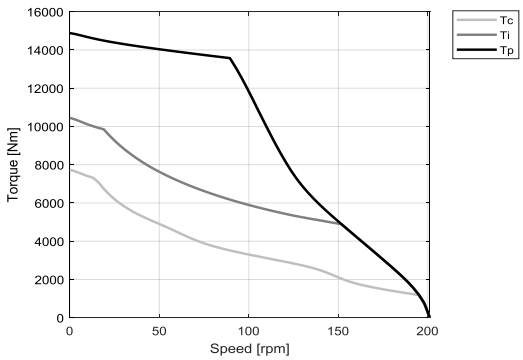

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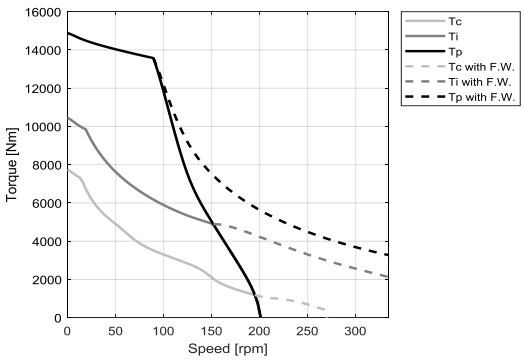

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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+1221-100

MOTOR PERFORMANCE		Winding codes	UE	UJ	WJ	WT
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	19700	21400	21400	21400
Ti	Intermittent torque	Nm	14800	14800	15100	15100
Tc	Continuous torque	Nm	10900	10900	11200	11200
Ts	Standstill torque	Nm	8760	8760	8980	8980
Ip	Peak current	Arms	121	298	432	865
Ii	Intermittent current	Arms	72.5	145	217	433
Ic	Continuous current	Arms	45.8	91.7	137	274
Is	Standstill current	Arms	34.7	69.4	104	208
ns	Rated low speed	rpm	0.030	0.030	0.029	0.029
nm	Maximum speed without flux weakening	rpm	24.2	48.4	70.3	141
nm,FW	Maximum speed with flux weakening	rpm	84.0	126	160	229
τon,p	Maximum ON time for peak cycle	s	10	5.0	5.7	5.7
τon,i	Maximum ON time for intermittent cycle	s	2.9	2.9	2.9	2.9
Pp	Power dissipation @ Ip	W	87100	140000	131000	131000
Pi	Power dissipation @ Ii	W	39200	39200	39300	39300
Pc	Power dissipation @ Ic	W	15700	15700	15700	15700
Td	Max. detent torque (average to peak)	Nm	54	54	54	54

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	286	143	98.5	49.2
Ku	Back EMF constant (*)	Vrms/(rad/s)	164	82.0	56.6	28.3
Km	Motor constant	Nm/√W	125	125	128	128
R20	Electrical resistance at 20°C (*)	Ohm	3.51	0.877	0.394	0.0985
Ld/Lq	Electrical inductance (*)	mH	51.5 / 44.8	12.9 / 11.2	6.12 / 5.26	1.53 / 1.32
Isc	Maximum short-circuit current	Arms	33.5	66.9	97.1	194
nb	Base speed	rpm	10.6	34.3	56.4	128
nb,i	Base speed at intermittent duty cycle	rpm	5.68	25.0	42.7	104
nb,p	Base speed at peak duty cycle	rpm	0.00	13.5	26.8	63.0
nn	Rated speed	rpm	8.77	29.7	49.6	117
Tn	Rated torque	Nm	10500	7810	6380	3960
In	Rated current	Arms	45.4	63.5	73.6	93.8
τth	Thermal time constant	s	184	184	188	188
Rth	Thermal resistance	K/W	0.00648	0.00648	0.00646	0.00646
2p	Number of poles	-	220	220	220	220
J	Rotor inertia	kg·m²	32.9	32.9	32.9	32.9
mr	Rotor mass	kg	107	107	107	107
ms	Stator mass	kg	298	298	300	300

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	0.940	0.940	0.940	0.940
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	10	10	10	10
qw	Minimum water flow for Δθw	l/min	24	24	25	25
Δpw	Max. pressure drop at qw	bar	1.1	1.1	1.1	1.1

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
Please refer to ETEL Integration Manual for the mass of the optional cooling jacket and the possible additional pressure drop.

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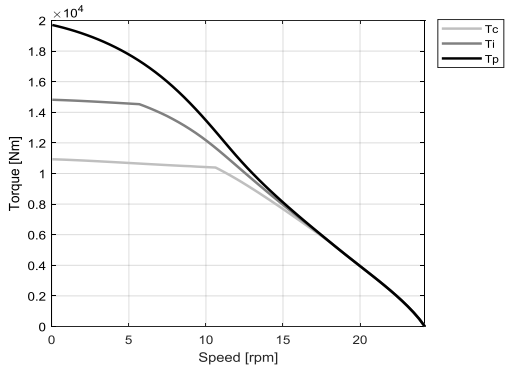
UE - WATER COOLING



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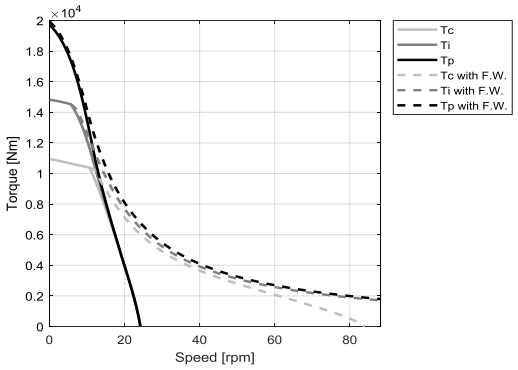
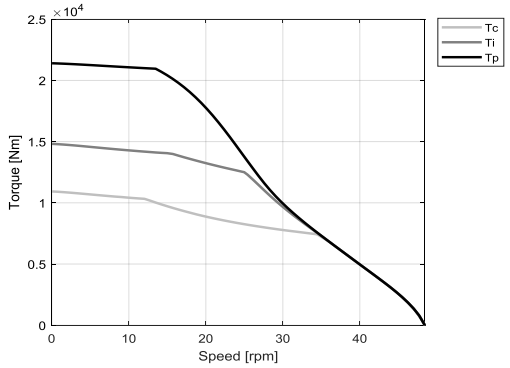


UJ - WATER COOLING



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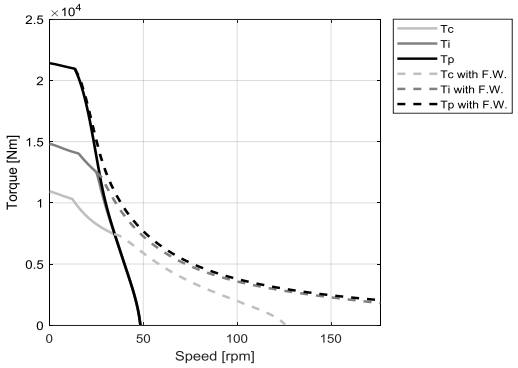
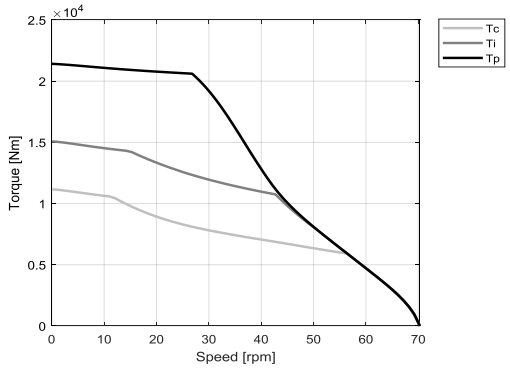


WJ - WATER COOLING



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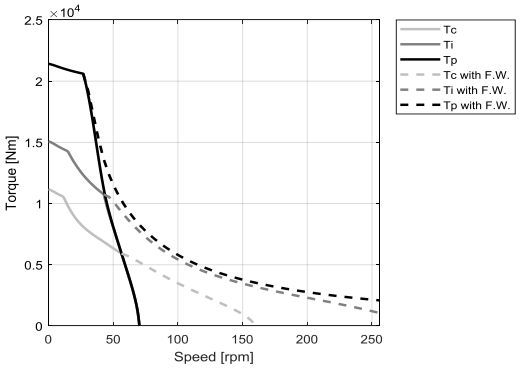

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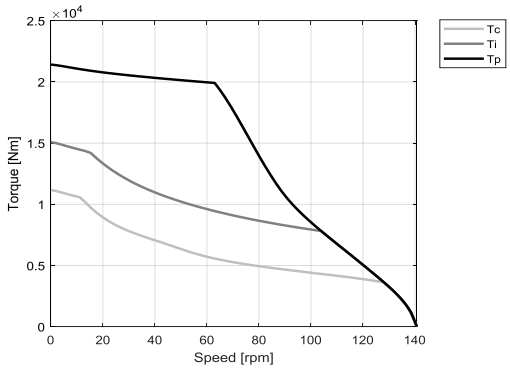

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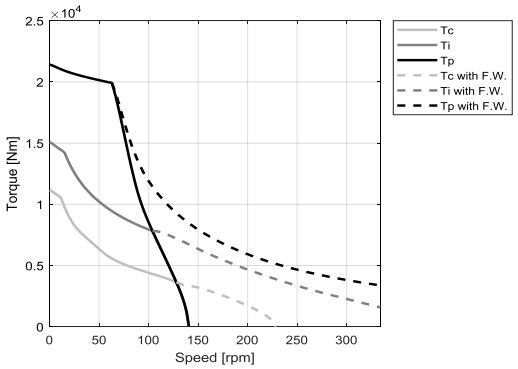

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TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+1221-150

MOTOR PERFORMANCE		Winding codes	WE	UJ	WJ	WT
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	WATER COOLING
Tp	Peak torque	Nm	30700	32200	32200	32200
Ti	Intermittent torque	Nm	22700	22300	22700	22700
Tc	Continuous torque	Nm	16800	16400	16800	16800
Ts	Standstill torque	Nm	13500	13100	13500	13500
Ip	Peak current	Arms	188	293	426	851
Ii	Intermittent current	Arms	108	144	216	432
Ic	Continuous current	Arms	68.2	91.1	136	273
Is	Standstill current	Arms	51.7	69.0	103	207
ns	Rated low speed	rpm	0.028	0.029	0.028	0.028
nm	Maximum speed without flux weakening	rpm	23.4	32.3	46.9	93.8
nm,FW	Maximum speed with flux weakening	rpm	76.4	91.7	116	175
τon,p	Maximum ON time for peak cycle	s	8.2	4.5	5.2	5.2
τon,i	Maximum ON time for intermittent cycle	s	2.8	2.8	2.8	2.8
Pp	Power dissipation @ Ip	W	135000	193000	180000	180000
Pi	Power dissipation @ Ii	W	55200	54900	55200	55200
Pc	Power dissipation @ Ic	W	22100	22000	22100	22100
Td	Max. detent torque (average to peak)	Nm	81	81	81	81

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	296	214	148	73.9
Ku	Back EMF constant (*)	Vrms/(rad/s)	170	123	84.8	42.4
Km	Motor constant	Nm/√W	161	156	161	161
R20	Electrical resistance at 20°C (*)	Ohm	2.25	1.25	0.562	0.140
Ld/Lq	Electrical inductance (*)	mH	36.3 / 31.4	19.1 / 16.7	9.09 / 7.86	2.27 / 1.96
Isc	Maximum short-circuit current	Arms	49.0	67.6	98.0	196
nb	Base speed	rpm	10.9	20.0	34.5	81.4
nb,i	Base speed at intermittent duty cycle	rpm	6.18	12.3	25.4	64.4
nb,p	Base speed at peak duty cycle	rpm	0.00	3.22	14.6	40.0
nn	Rated speed	rpm	8.87	16.7	29.9	74.2
Tn	Rated torque	Nm	16000	13600	11300	7270
In	Rated current	Arms	67.4	75.7	87.4	112
τth	Thermal time constant	s	192	188	192	192
Rth	Thermal resistance	K/W	0.00449	0.00450	0.00449	0.00449
2p	Number of poles	-	220	220	220	220
J	Rotor inertia	kg·m²	48.5	48.5	48.5	48.5
mr	Rotor mass	kg	158	158	158	158
ms	Stator mass	kg	399	397	399	399

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	600
Di	Intermittent duty cycle	%	40	40	40	40
Dp	Peak duty cycle	%	5.0	5.0	5.0	5.0
Sr	Rotor exchange surface	m²	1.300	1.300	1.300	1.300
θamb	Ambient temperature	°C	20	20	20	20
θmax	Maximum coil temperature	°C	130	130	130	130
θw	Inlet water temperature	°C	20	20	20	20
Δθw	Water temperature difference for Pc	K	10	10	10	10
qw	Minimum water flow for Δθw	l/min	34	34	34	34
Δpw	Max. pressure drop at qw	bar	1.9	1.9	1.9	1.9

Notes: (*) terminal to terminal.
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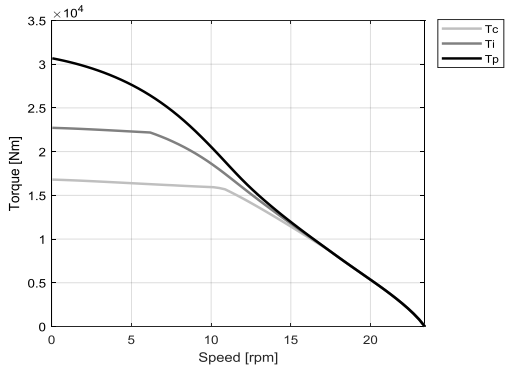
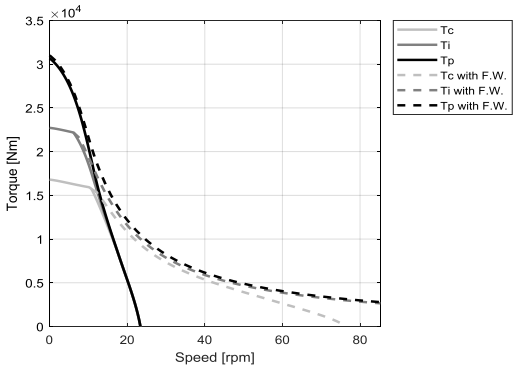
CONVENTIONAL TORQUE MOTOR TMB+1221-150

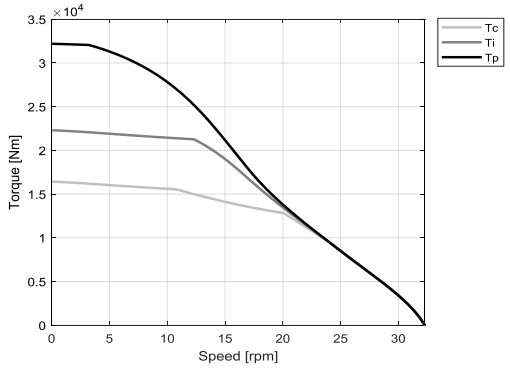
WE - WATER COOLING



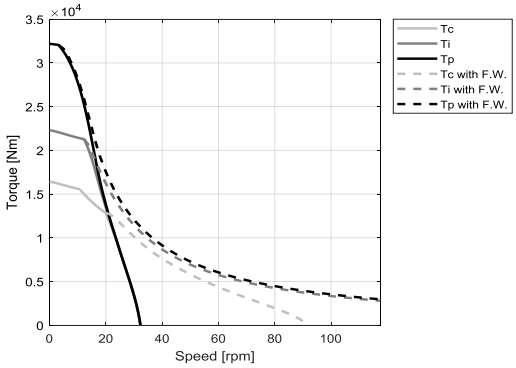
WE - WATER COOLING



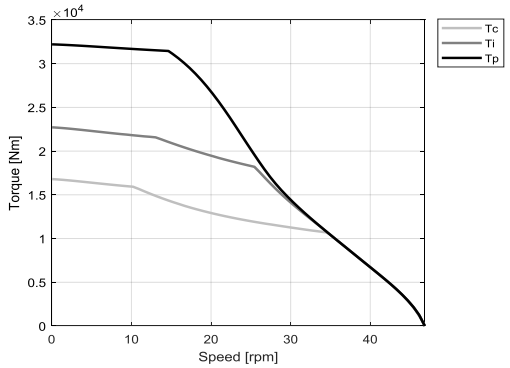
UJ - WATER COOLING



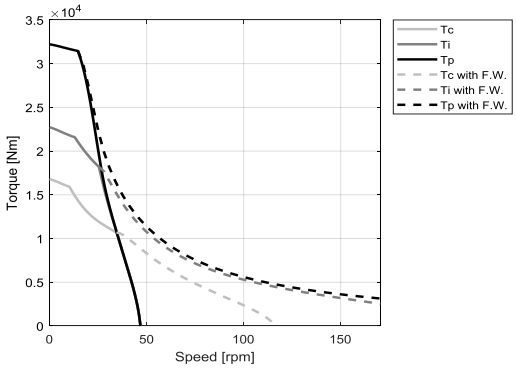
UJ - WATER COOLING



WJ - WATER COOLING



WJ - WATER COOLING



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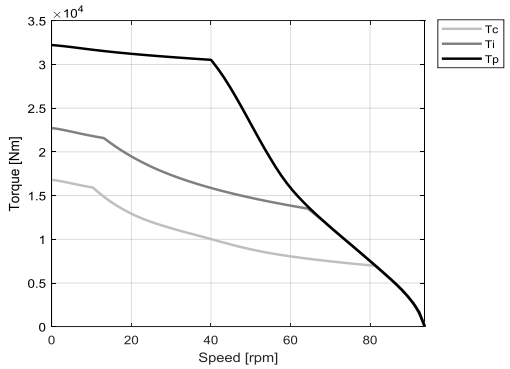

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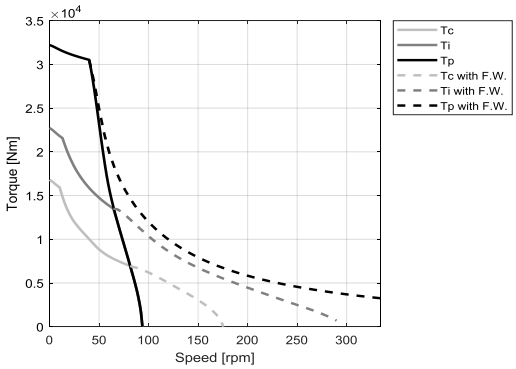

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ETEL

TMB+ Standard

CONVENTIONAL TORQUE MOTOR TMB+1221-200

		Winding codes	WJ	UT	WT	
MOTOR PERFORMANCE		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	
Tp	Peak torque	Nm	42900	42900	42900	
Ti	Intermittent torque	Nm	30200	29600	30200	
Tc	Continuous torque	Nm	22300	21800	22300	
Ts	Standstill torque	Nm	17900	17400	17900	
Ip	Peak current	Arms	421	580	841	
Ii	Intermittent current	Arms	214	285	427	
Ic	Continuous current	Arms	135	180	270	
Is	Standstill current	Arms	102	137	205	
ns	Rated low speed	rpm	0.029	0.029	0.029	
nm	Maximum speed without flux weakening	rpm	35.1	48.5	70.3	
nm,FW	Maximum speed with flux weakening	rpm	92.1	113	142	
τon,p	Maximum ON time for peak cycle	s	4.5	3.8	4.5	
τon,i	Maximum ON time for intermittent cycle	s	2.8	2.8	2.8	
Pp	Power dissipation @ Ip	W	228000	245000	228000	
Pi	Power dissipation @ Ii	W	70100	69700	70100	
Pc	Power dissipation @ Ic	W	28000	27900	28000	
Td	Max. detent torque (average to peak)	Nm	110	110	110	

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	197	143	98.6	
Ku	Back EMF constant (*)	Vrms/(rad/s)	113	82.0	56.6	
Km	Motor constant	Nm/√W	188	182	188	
R20	Electrical resistance at 20°C (*)	Ohm	0.735	0.411	0.184	
Ld/Lq	Electrical inductance (*)	mH	12.1 / 10.5	6.34 / 5.59	3.01 / 2.62	
Isc	Maximum short-circuit current	Arms	98.5	136	197	
nb	Base speed	rpm	24.0	37.2	59.3	
nb,i	Base speed at intermittent duty cycle	rpm	16.4	27.3	45.8	
nb,p	Base speed at peak duty cycle	rpm	7.72	15.2	28.1	
nn	Rated speed	rpm	20.5	32.2	53.7	
Tn	Rated torque	Nm	16500	13900	10700	
In	Rated current	Arms	97.0	110	122	
τth	Thermal time constant	s	191	188	191	
Rth	Thermal resistance	K/W	0.00340	0.00342	0.00340	
2p	Number of poles	-	220	220	220	
J	Rotor inertia	kg·m²	64.7	64.7	64.7	
mr	Rotor mass	kg	211	211	211	
ms	Stator mass	kg	495	492	495	

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600	600	
Di	Intermittent duty cycle	%	40	40	40	
Dp	Peak duty cycle	%	5.0	5.0	5.0	
Sr	Rotor exchange surface	m²	1.600	1.600	1.600	
θamb	Ambient temperature	°C	20	20	20	
θmax	Maximum coil temperature	°C	130	130	130	
θw	Inlet water temperature	°C	20	20	20	
Δθw	Water temperature difference for Pc	K	10	10	10	
qw	Minimum water flow for Δθw	l/min	44	44	44	
Δpw	Max. pressure drop at qw	bar	2.9	2.9	2.9	

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
Please refer to ETEL Integration Manual for the mass of the optional cooling jacket and the possible additional pressure drop.

Caution: Any use of the motor beyond speed/torque limit could lead to hazardous voltage and serious injuries. Customer is responsible for setting safeties/limitations that will keep the motor in its safe operating area. ETEL cannot be held responsible if the motor is used in an improper way.

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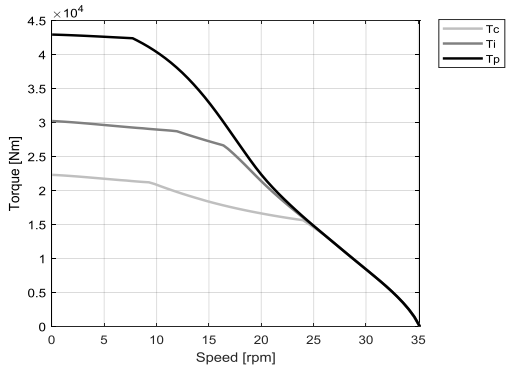
CONVENTIONAL TORQUE MOTOR TMB+1221-200

WJ - WATER COOLING



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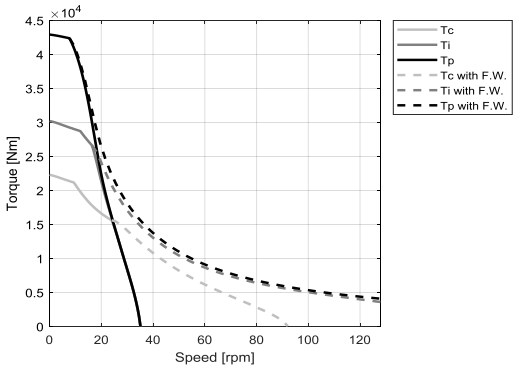
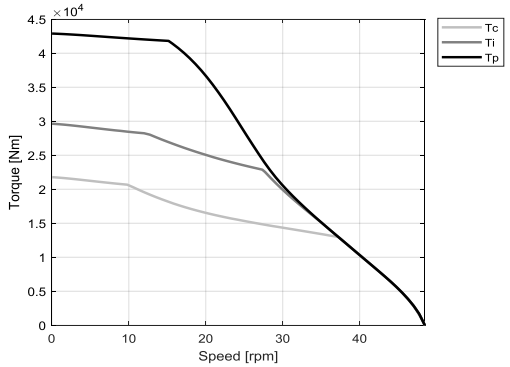


UT - WATER COOLING



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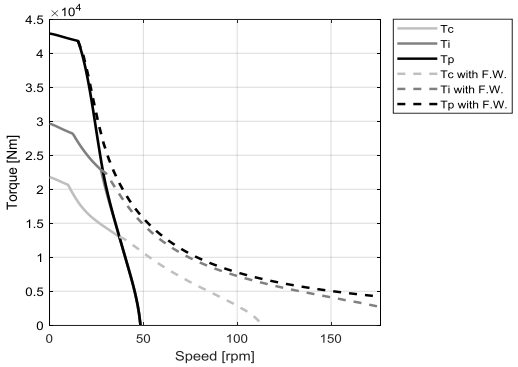

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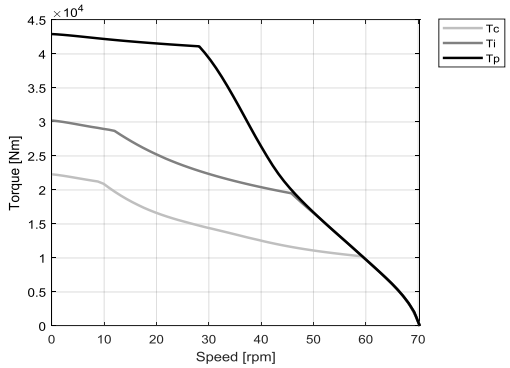

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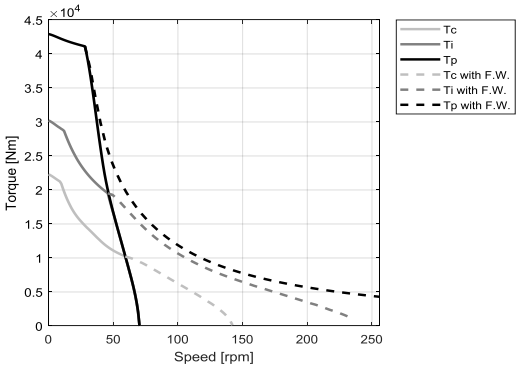

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