

Torque **Motors**

TMK DATA SHEETS

ETEL

MOTOR PERFORMANCE		Winding codes	3UAS	3UBS		
		UNIT	WATER COOLING	WATER COOLING		
Tp	Peak torque	Nm	121	121		
Ti	Intermittent torque	Nm	105	105		
Tc	Continuous torque	Nm	80.5	80.5		
Ts	Standstill torque	Nm	66.0	66.0		
Ip	Peak current	Arms	25.1	50.2		
Ii	Intermittent current	Arms	20.9	41.7		
Ic	Continuous current	Arms	13.2	26.4		
Is	Standstill current	Arms	10.0	20.0		
ns	Rated low speed	rpm	0.49	0.49		
nm	Maximum speed without flux weakening	rpm	880	1760		
nm,FW	Maximum speed with flux weakening	rpm	3200	5450		
ton,p	Maximum ON time for peak cycle	s	29	29		
ton,i	Maximum ON time for intermittent cycle	s	3.1	3.1		
Pp	Power dissipation @ Ip	W	4440	4440		
Pi	Power dissipation @ Ii	W	4110	4110		
Pc	Power dissipation @ Ic	W	1640	1640		
Td	Max. detent torque (average to peak)	Nm	1.0	1.0		

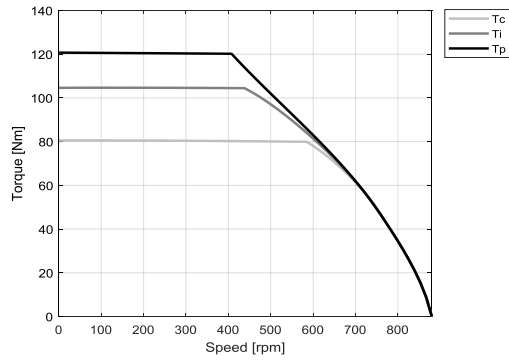
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	7.72	3.86		
Ku	Back EMF constant (*)	Vrms/(rad/s)	4.51	2.26		
Km	Motor constant	Nm/√W	3.00	3.00		
R20	Electrical resistance at 20°C (*)	Ohm	4.40	1.10		
Ld/Lq	Electrical inductance (*)	mH	45.9 / 33.4	11.5 / 8.34		
Isc	Maximum short-circuit current	Arms	10.3	20.6		
nb	Base speed	rpm	585	1280		
nb,i	Base speed at intermittent duty cycle	rpm	438	982		
nb,p	Base speed at peak duty cycle	rpm	407	890		
nn	Rated speed	rpm	517	1140		
Tn	Rated torque	Nm	80.1	78.1		
In	Rated current	Arms	13.1	25.5		
rth	Thermal time constant	s	111	111		
Rth	Thermal resistance	K/W	0.0653	0.0653		
2p	Number of poles	-	22	22		
J	Rotor inertia	kg·m²	0.00805	0.00805		
mr	Rotor mass	kg	4.28	4.28		
ms	Stator mass	kg	10.4	10.4		

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	0.026	0.026		
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	4.7	4.7		
Δpw	Max. pressure drop at qw	bar	0.1	0.1		

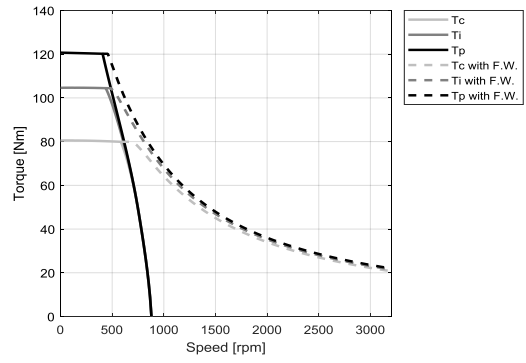
Notes: (*) terminal to terminal.
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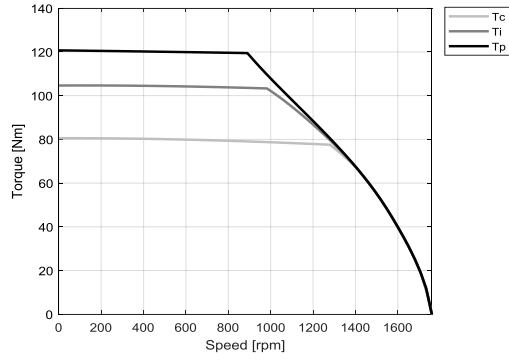
3UAS - WATER COOLING



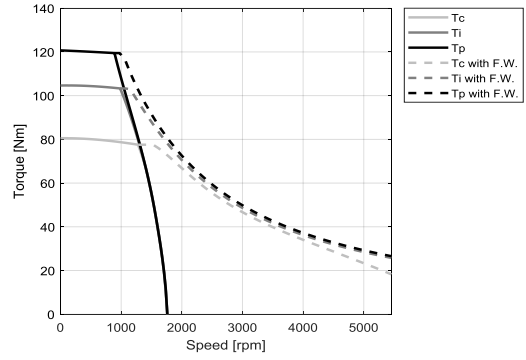
3UAS - WATER COOLING



3UBS - WATER COOLING



3UBS - WATER COOLING



MOTOR PERFORMANCE		Winding codes	3UAS	3UBS		
		UNIT	WATER COOLING	WATER COOLING		
Tp	Peak torque	Nm	169	169		
Ti	Intermittent torque	Nm	147	147		
Tc	Continuous torque	Nm	113	113		
Ts	Standstill torque	Nm	93.0	93.0		
Ip	Peak current	Arms	25.1	50.2		
Ii	Intermittent current	Arms	21.1	42.1		
Ic	Continuous current	Arms	13.3	26.6		
Is	Standstill current	Arms	10.1	20.2		
ns	Rated low speed	rpm	0.54	0.54		
nm	Maximum speed without flux weakening	rpm	629	1260		
nm,FW	Maximum speed with flux weakening	rpm	2290	4580		
ton,p	Maximum ON time for peak cycle	s	27	27		
ton,i	Maximum ON time for intermittent cycle	s	5.7	5.7		
Pp	Power dissipation @ Ip	W	5560	5560		
Pi	Power dissipation @ Ii	W	5190	5190		
Pc	Power dissipation @ Ic	W	2070	2070		
Td	Max. detent torque (average to peak)	Nm	1.4	1.4		

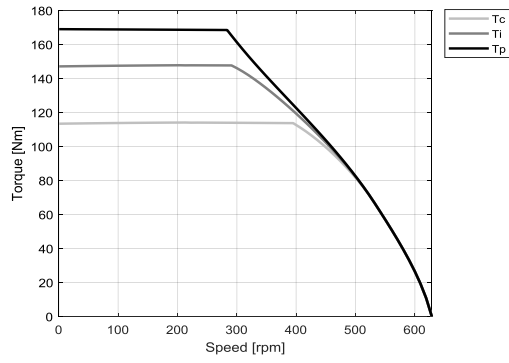
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	10.8	5.40		
Ku	Back EMF constant (*)	Vrms/(rad/s)	6.32	3.16		
Km	Motor constant	Nm/√W	3.75	3.75		
R20	Electrical resistance at 20°C (*)	Ohm	5.52	1.38		
Ld/Lq	Electrical inductance (*)	mH	61.7 / 46.7	15.4 / 11.7		
Isc	Maximum short-circuit current	Arms	10.8	21.5		
nb	Base speed	rpm	395	879		
nb,i	Base speed at intermittent duty cycle	rpm	291	682		
nb,p	Base speed at peak duty cycle	rpm	284	641		
nn	Rated speed	rpm	347	782		
Tn	Rated torque	Nm	114	112		
In	Rated current	Arms	13.4	26.5		
rth	Thermal time constant	s	101	101		
Rth	Thermal resistance	K/W	0.0497	0.0497		
2p	Number of poles	-	22	22		
J	Rotor inertia	kg·m²	0.0107	0.0107		
mr	Rotor mass	kg	5.62	5.62		
ms	Stator mass	kg	13.1	13.1		

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	0.030	0.030		
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	6.0	6.0		
Δpw	Max. pressure drop at qw	bar	0.1	0.1		

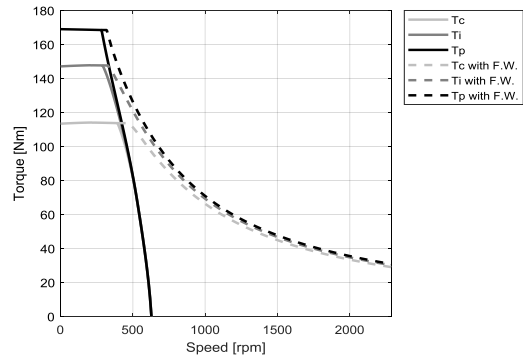
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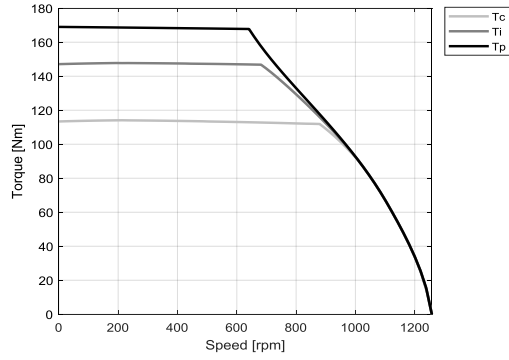
3UAS - WATER COOLING



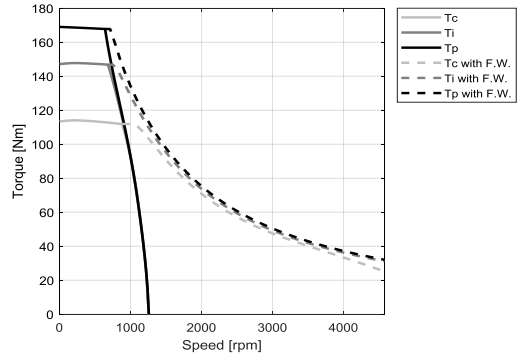
3UAS - WATER COOLING



3UBS - WATER COOLING



3UBS - WATER COOLING



MOTOR PERFORMANCE		Winding codes	3UBS	3XBS		
		UNIT	WATER COOLING	WATER COOLING		
Tp	Peak torque	Nm	242	242		
Ti	Intermittent torque	Nm	215	214		
Tc	Continuous torque	Nm	167	166		
Ts	Standstill torque	Nm	138	137		
Ip	Peak current	Arms	50.2	96.0		
Ii	Intermittent current	Arms	44.1	83.7		
Ic	Continuous current	Arms	27.9	52.9		
Is	Standstill current	Arms	21.1	40.1		
ns	Rated low speed	rpm	0.61	0.60		
nm	Maximum speed without flux weakening	rpm	880	1680		
nm,FW	Maximum speed with flux weakening	rpm	3200	5450		
ton,p	Maximum ON time for peak cycle	s	28	27		
ton,i	Maximum ON time for intermittent cycle	s	6.7	6.7		
Pp	Power dissipation @ Ip	W	6880	7030		
Pi	Power dissipation @ Ii	W	7020	7070		
Pc	Power dissipation @ Ic	W	2810	2830		
Td	Max. detent torque (average to peak)	Nm	2.0	2.0		

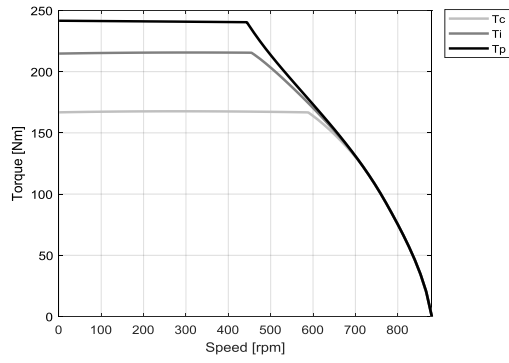
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	7.72	4.04		
Ku	Back EMF constant (*)	Vrms/(rad/s)	4.51	2.36		
Km	Motor constant	Nm/√W	4.80	4.76		
R20	Electrical resistance at 20°C (*)	Ohm	1.72	0.480		
Ld/Lq	Electrical inductance (*)	mH	21.5 / 16.3	5.89 / 4.45		
Isc	Maximum short-circuit current	Arms	22.0	42.1		
nb	Base speed	rpm	589	1230		
nb,i	Base speed at intermittent duty cycle	rpm	455	950		
nb,p	Base speed at peak duty cycle	rpm	444	901		
nn	Rated speed	rpm	522	1090		
Tn	Rated torque	Nm	167	161		
In	Rated current	Arms	28.2	51.3		
rth	Thermal time constant	s	89.8	90.4		
Rth	Thermal resistance	K/W	0.0357	0.0354		
2p	Number of poles	-	22	22		
J	Rotor inertia	kg·m²	0.0146	0.0146		
mr	Rotor mass	kg	7.63	7.63		
ms	Stator mass	kg	16.5	16.6		

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	0.036	0.036		
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	8.1	8.1		
Δpw	Max. pressure drop at qw	bar	0.3	0.3		

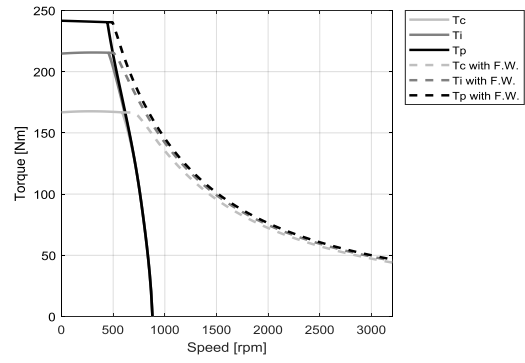
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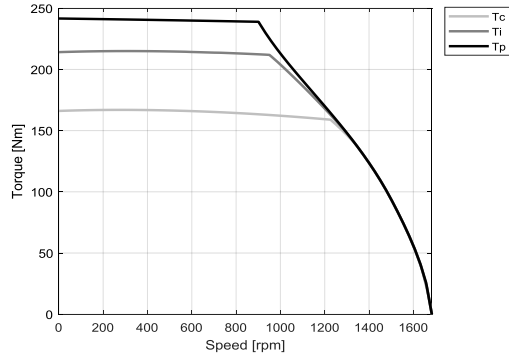
3UBS - WATER COOLING



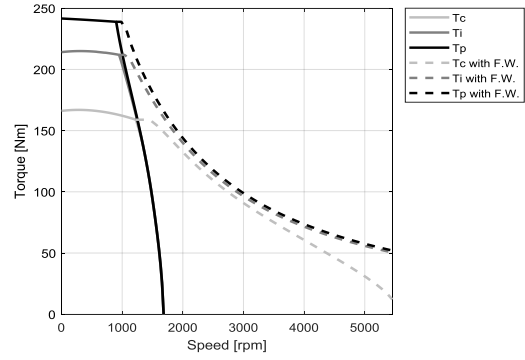
3UBS - WATER COOLING



3XBS - WATER COOLING



3XBS - WATER COOLING



MOTOR PERFORMANCE		Winding codes	3UBS	3XBS		
		UNIT	WATER COOLING	WATER COOLING		
Tp	Peak torque	Nm	362	362		
Ti	Intermittent torque	Nm	322	320		
Tc	Continuous torque	Nm	250	248		
Ts	Standstill torque	Nm	206	204		
Ip	Peak current	Arms	50.2	96.0		
Ii	Intermittent current	Arms	44.0	83.0		
Ic	Continuous current	Arms	27.9	52.5		
Is	Standstill current	Arms	21.1	39.8		
ns	Rated low speed	rpm	0.65	0.64		
nm	Maximum speed without flux weakening	rpm	587	1120		
nm,FW	Maximum speed with flux weakening	rpm	2140	4080		
ton,p	Maximum ON time for peak cycle	s	26	25		
ton,i	Maximum ON time for intermittent cycle	s	7.8	7.9		
Pp	Power dissipation @ Ip	W	9600	9950		
Pi	Power dissipation @ Ii	W	9700	9770		
Pc	Power dissipation @ Ic	W	3880	3910		
Td	Max. detent torque (average to peak)	Nm	3.0	3.0		

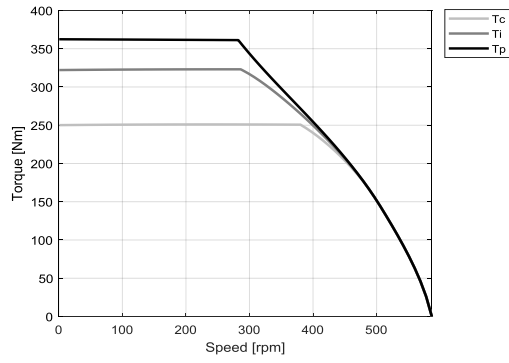
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	11.6	6.05		
Ku	Back EMF constant (*)	Vrms/(rad/s)	6.77	3.54		
Km	Motor constant	Nm/√W	6.10	5.99		
R20	Electrical resistance at 20°C (*)	Ohm	2.40	0.680		
Ld/Lq	Electrical inductance (*)	mH	31.5 / 23.4	8.63 / 6.42		
Isc	Maximum short-circuit current	Arms	22.6	43.1		
nb	Base speed	rpm	380	801		
nb,i	Base speed at intermittent duty cycle	rpm	286	623		
nb,p	Base speed at peak duty cycle	rpm	282	593		
nn	Rated speed	rpm	335	712		
Tn	Rated torque	Nm	251	245		
In	Rated current	Arms	28.2	52.3		
rth	Thermal time constant	s	84.5	84.9		
Rth	Thermal resistance	K/W	0.0250	0.0248		
2p	Number of poles	-	22	22		
J	Rotor inertia	kg·m²	0.0212	0.0212		
mr	Rotor mass	kg	11.0	11.0		
ms	Stator mass	kg	23.4	23.4		

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	0.046	0.046		
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	11	11		
Δpw	Max. pressure drop at qw	bar	0.5	0.5		

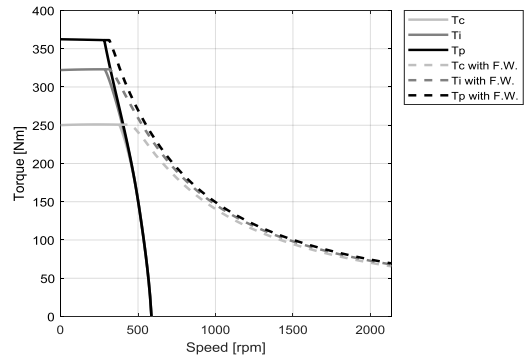
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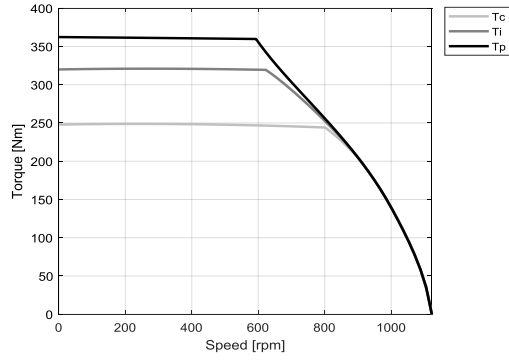
3UBS - WATER COOLING



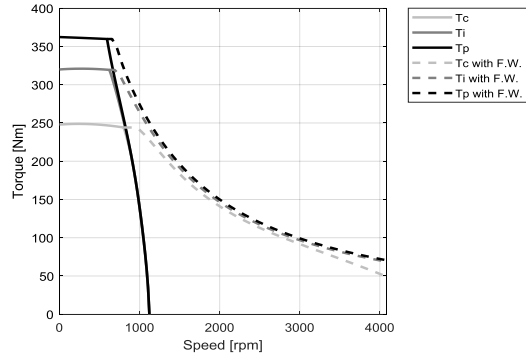
3UBS - WATER COOLING



3XBS - WATER COOLING



3XBS - WATER COOLING



MOTOR PERFORMANCE		Winding codes	3VBS	3VDS		
		UNIT	WATER COOLING	WATER COOLING		
Tp	Peak torque	Nm	441	441		
Ti	Intermittent torque	Nm	354	354		
Tc	Continuous torque	Nm	271	271		
Ts	Standstill torque	Nm	222	222		
Ip	Peak current	Arms	75.6	151		
Ii	Intermittent current	Arms	51.3	103		
Ic	Continuous current	Arms	32.5	64.9		
Is	Standstill current	Arms	24.6	49.2		
ns	Rated low speed	rpm	0.22	0.22		
nm	Maximum speed without flux weakening	rpm	662	1320		
nm,FW	Maximum speed with flux weakening	rpm	2410	2730		
ton,p	Maximum ON time for peak cycle	s	14	18		
ton,i	Maximum ON time for intermittent cycle	s	3.0	3.0		
Pp	Power dissipation @ Ip	W	12400	12400		
Pi	Power dissipation @ Ii	W	7470	7470		
Pc	Power dissipation @ Ic	W	2990	2990		
Td	Max. detent torque (average to peak)	Nm	2.0	2.0		

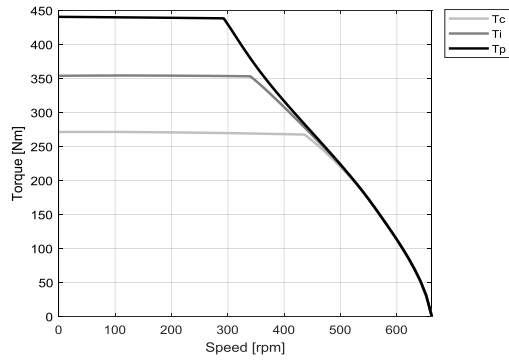
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	10.3	5.17		
Ku	Back EMF constant (*)	Vrms/(rad/s)	6.00	3.00		
Km	Motor constant	Nm/√W	7.35	7.35		
R20	Electrical resistance at 20°C (*)	Ohm	1.32	0.330		
Ld/Lq	Electrical inductance (*)	mH	13.0 / 10.1	3.25 / 2.53		
Isc	Maximum short-circuit current	Arms	24.2	48.4		
nb	Base speed	rpm	436	944		
nb,i	Base speed at intermittent duty cycle	rpm	340	735		
nb,p	Base speed at peak duty cycle	rpm	293	628		
nn	Rated speed	rpm	387	838		
Tn	Rated torque	Nm	268	257		
In	Rated current	Arms	31.9	60.5		
rth	Thermal time constant	s	124	124		
Rth	Thermal resistance	K/W	0.0360	0.0360		
2p	Number of poles	-	44	44		
J	Rotor inertia	kg·m²	0.104	0.104		
mr	Rotor mass	kg	11.9	11.9		
ms	Stator mass	kg	17.7	17.7		

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	0.064	0.064		
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	8.6	8.6		
Δpw	Max. pressure drop at qw	bar	0.3	0.3		

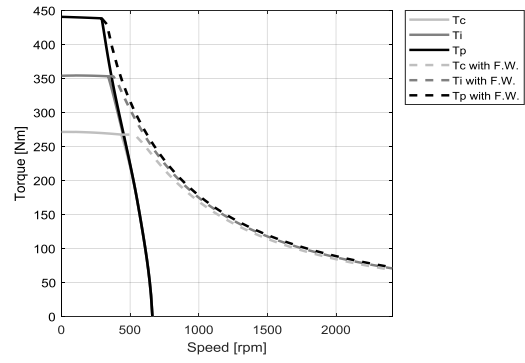
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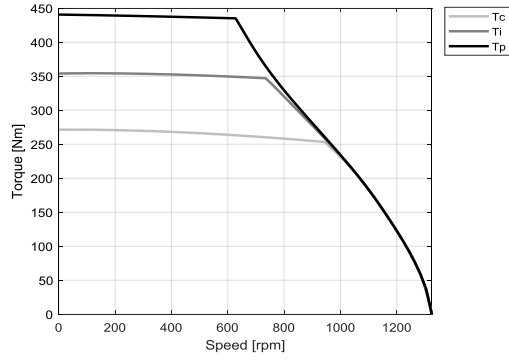
3VBS - WATER COOLING



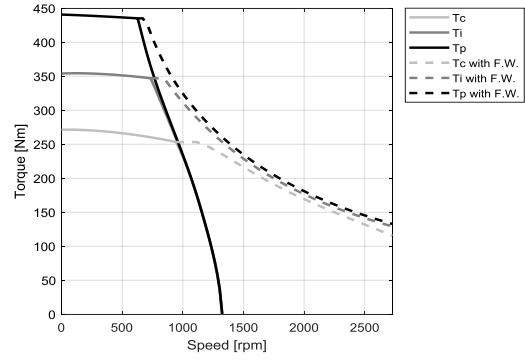
3VBS - WATER COOLING



3VDS - WATER COOLING



3VDS - WATER COOLING



MOTOR PERFORMANCE		Winding codes	3VBS	3VDS		
		UNIT	WATER COOLING	WATER COOLING		
Tp	Peak torque	Nm	617	617		
Ti	Intermittent torque	Nm	501	501		
Tc	Continuous torque	Nm	386	386		
Ts	Standstill torque	Nm	316	316		
Ip	Peak current	Arms	75.6	151		
Ii	Intermittent current	Arms	52.8	106		
Ic	Continuous current	Arms	33.4	66.7		
Is	Standstill current	Arms	25.3	50.6		
ns	Rated low speed	rpm	0.24	0.24		
nm	Maximum speed without flux weakening	rpm	473	946		
nm,FW	Maximum speed with flux weakening	rpm	1720	2730		
ton,p	Maximum ON time for peak cycle	s	14	18		
ton,i	Maximum ON time for intermittent cycle	s	2.9	2.9		
Pp	Power dissipation @ Ip	W	15400	15400		
Pi	Power dissipation @ Ii	W	9800	9800		
Pc	Power dissipation @ Ic	W	3920	3920		
Td	Max. detent torque (average to peak)	Nm	2.8	2.8		

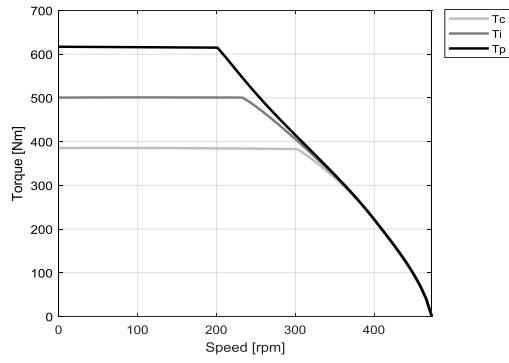
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	14.5	7.24		
Ku	Back EMF constant (*)	Vrms/(rad/s)	8.40	4.20		
Km	Motor constant	Nm/√W	9.24	9.24		
R20	Electrical resistance at 20°C (*)	Ohm	1.64	0.410		
Ld/Lq	Electrical inductance (*)	mH	18.1 / 13.8	4.52 / 3.45		
Isc	Maximum short-circuit current	Arms	24.4	48.7		
nb	Base speed	rpm	303	656		
nb,i	Base speed at intermittent duty cycle	rpm	233	515		
nb,p	Base speed at peak duty cycle	rpm	201	442		
nn	Rated speed	rpm	268	584		
Tn	Rated torque	Nm	384	375		
In	Rated current	Arms	33.0	64.0		
rth	Thermal time constant	s	115	115		
Rth	Thermal resistance	K/W	0.0274	0.0274		
2p	Number of poles	-	44	44		
J	Rotor inertia	kg·m²	0.136	0.136		
mr	Rotor mass	kg	15.6	15.6		
ms	Stator mass	kg	22.4	22.4		

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	0.074	0.074		
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	11	11		
Δpw	Max. pressure drop at qw	bar	0.5	0.5		

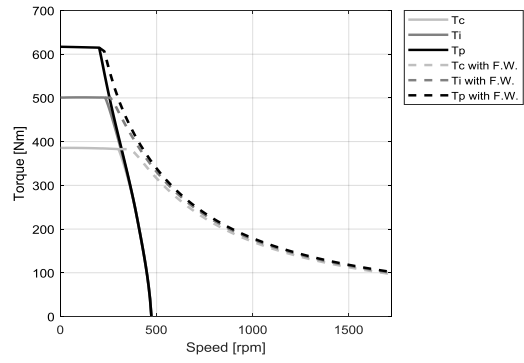
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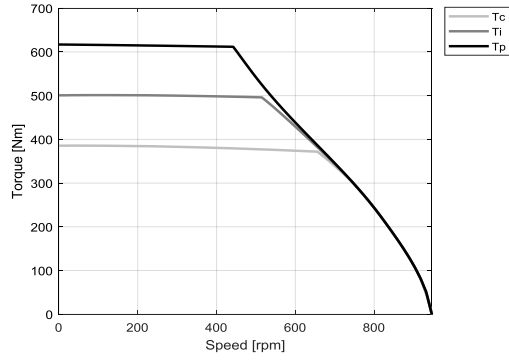
3VBS - WATER COOLING



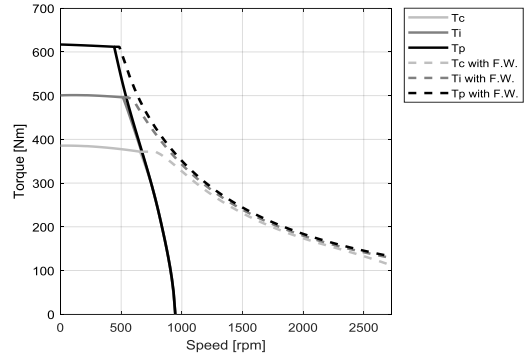
3VBS - WATER COOLING



3VDS - WATER COOLING



3VDS - WATER COOLING



MOTOR PERFORMANCE		Winding codes	3VBN	3VDS		
		UNIT	WATER COOLING	WATER COOLING		
Tp	Peak torque	Nm	881	881		
Ti	Intermittent torque	Nm	720	720		
Tc	Continuous torque	Nm	555	555		
Ts	Standstill torque	Nm	456	456		
Ip	Peak current	Arms	75.6	151		
Ii	Intermittent current	Arms	53.5	107		
Ic	Continuous current	Arms	33.9	67.7		
Is	Standstill current	Arms	25.7	51.3		
ns	Rated low speed	rpm	0.27	0.27		
nm	Maximum speed without flux weakening	rpm	331	662		
nm,FW	Maximum speed with flux weakening	rpm	1210	2410		
ton,p	Maximum ON time for peak cycle	s	14	16		
ton,i	Maximum ON time for intermittent cycle	s	3.5	3.5		
Pp	Power dissipation @ Ip	W	20500	20500		
Pi	Power dissipation @ Ii	W	13500	13500		
Pc	Power dissipation @ Ic	W	5390	5390		
Td	Max. detent torque (average to peak)	Nm	4.0	4.0		

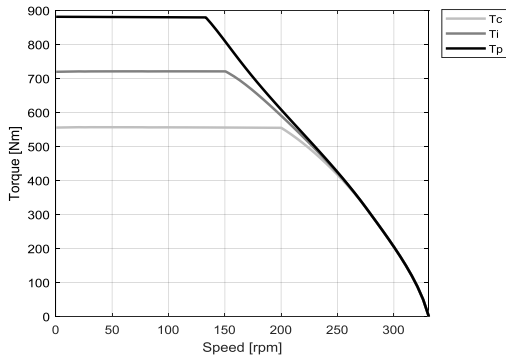
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	20.7	10.3		
Ku	Back EMF constant (*)	Vrms/(rad/s)	12.0	6.00		
Km	Motor constant	Nm/√W	11.4	11.4		
R20	Electrical resistance at 20°C (*)	Ohm	2.20	0.550		
Ld/Lq	Electrical inductance (*)	mH	25.0 / 19.4	6.24 / 4.86		
Isc	Maximum short-circuit current	Arms	25.2	50.4		
nb	Base speed	rpm	200	443		
nb,i	Base speed at intermittent duty cycle	rpm	151	350		
nb,p	Base speed at peak duty cycle	rpm	133	310		
nn	Rated speed	rpm	176	394		
Tn	Rated torque	Nm	555	549		
In	Rated current	Arms	33.8	66.6		
rth	Thermal time constant	s	103	103		
Rth	Thermal resistance	K/W	0.0197	0.0197		
2p	Number of poles	-	44	44		
J	Rotor inertia	kg·m²	0.185	0.185		
mr	Rotor mass	kg	21.0	21.0		
ms	Stator mass	kg	28.7	28.7		

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	0.090	0.090		
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	15	15		
Δpw	Max. pressure drop at qw	bar	0.9	0.9		

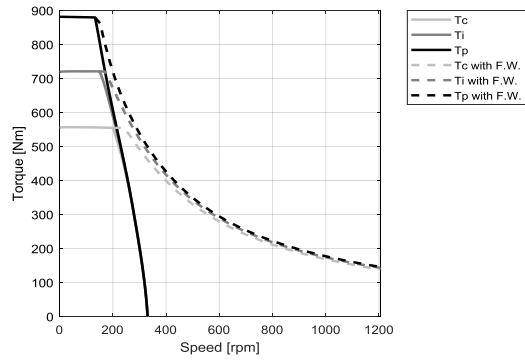
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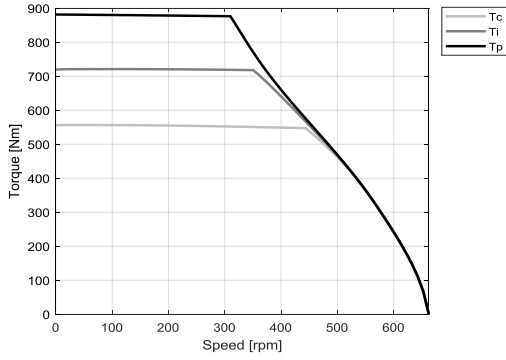
3VBN - WATER COOLING



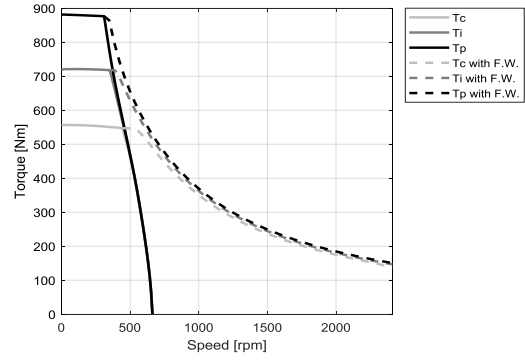
3VBN - WATER COOLING



3VDS - WATER COOLING



3VDS - WATER COOLING



MOTOR PERFORMANCE		Winding codes	3VDS	3VHS		
		UNIT	WATER COOLING	WATER COOLING		
Tp	Peak torque	Nm	1320	1320		
Ti	Intermittent torque	Nm	1080	1080		
Tc	Continuous torque	Nm	831	834		
Ts	Standstill torque	Nm	682	685		
Ip	Peak current	Arms	151	302		
Ii	Intermittent current	Arms	107	215		
Ic	Continuous current	Arms	67.4	136		
Is	Standstill current	Arms	51.1	103		
ns	Rated low speed	rpm	0.28	0.28		
nm	Maximum speed without flux weakening	rpm	442	883		
nm,FW	Maximum speed with flux weakening	rpm	1610	2730		
ton,p	Maximum ON time for peak cycle	s	15	15		
ton,i	Maximum ON time for intermittent cycle	s	5.0	5.0		
Pp	Power dissipation @ Ip	W	28700	28300		
Pi	Power dissipation @ Ii	W	18500	18500		
Pc	Power dissipation @ Ic	W	7410	7410		
Td	Max. detent torque (average to peak)	Nm	6.0	6.0		

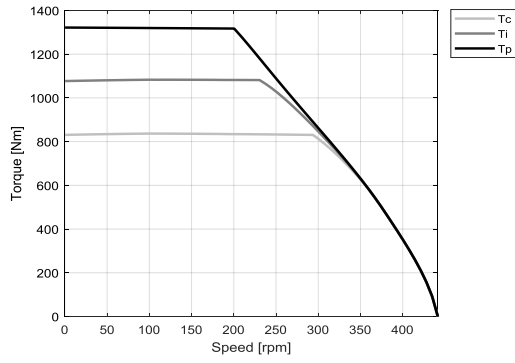
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	15.5	7.76		
Ku	Back EMF constant (*)	Vrms/(rad/s)	9.00	4.50		
Km	Motor constant	Nm/√W	14.4	14.5		
R20	Electrical resistance at 20°C (*)	Ohm	0.770	0.190		
Ld/Lq	Electrical inductance (*)	mH	8.91 / 6.89	2.23 / 1.72		
Isc	Maximum short-circuit current	Arms	53.0	106		
nb	Base speed	rpm	294	634		
nb,i	Base speed at intermittent duty cycle	rpm	230	507		
nb,p	Base speed at peak duty cycle	rpm	200	439		
nn	Rated speed	rpm	260	564		
Tn	Rated torque	Nm	832	816		
In	Rated current	Arms	67.8	132		
rth	Thermal time constant	s	98.1	98.1		
Rth	Thermal resistance	K/W	0.0138	0.0138		
2p	Number of poles	-	44	44		
J	Rotor inertia	kg·m²	0.266	0.266		
mr	Rotor mass	kg	30.2	30.2		
ms	Stator mass	kg	40.5	40.5		

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	0.117	0.117		
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	21	21		
Δpw	Max. pressure drop at qw	bar	1.7	1.7		

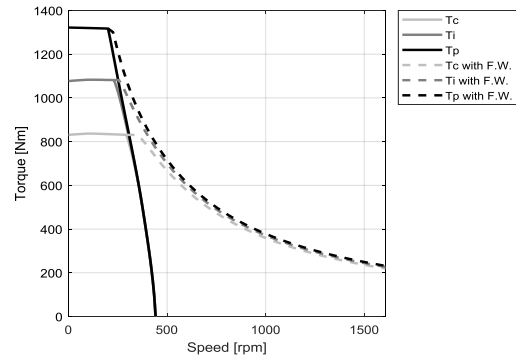
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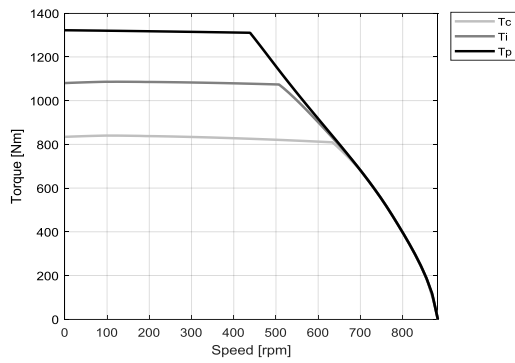
3VDS - WATER COOLING



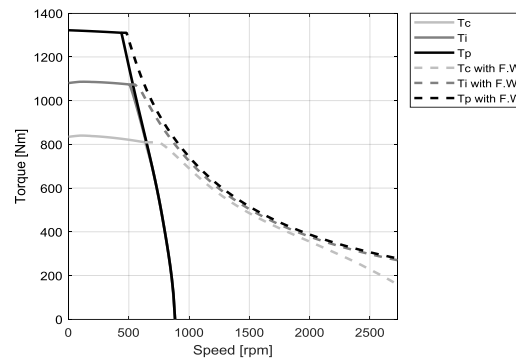
3VDS - WATER COOLING



3VHS - WATER COOLING



3VHS - WATER COOLING



MOTOR PERFORMANCE		Winding codes	3UBN	3UDS		
		UNIT	WATER COOLING	WATER COOLING		
Tp	Peak torque	Nm	756	756		
Ti	Intermittent torque	Nm	678	674		
Tc	Continuous torque	Nm	516	512		
Ts	Standstill torque	Nm	421	417		
Ip	Peak current	Arms	47.4	94.9		
Ii	Intermittent current	Arms	42.5	84.0		
Ic	Continuous current	Arms	26.9	53.1		
Is	Standstill current	Arms	20.3	40.2		
ns	Rated low speed	rpm	0.14	0.14		
nm	Maximum speed without flux weakening	rpm	288	577		
nm,FW	Maximum speed with flux weakening	rpm	1050	1820		
ton,p	Maximum ON time for peak cycle	s	37	39		
ton,i	Maximum ON time for intermittent cycle	s	2.9	2.9		
Pp	Power dissipation @ Ip	W	9210	9440		
Pi	Power dissipation @ Ii	W	9990	9990		
Pc	Power dissipation @ Ic	W	4000	4000		
Td	Max. detent torque (average to peak)	Nm	3.0	3.0		

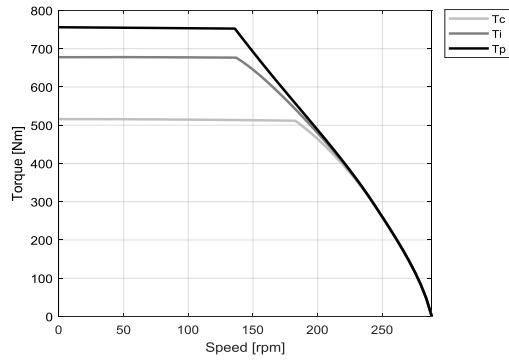
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	23.8	11.9		
Ku	Back EMF constant (*)	Vrms/(rad/s)	13.8	6.89		
Km	Motor constant	Nm/√W	12.1	11.9		
R20	Electrical resistance at 20°C (*)	Ohm	2.58	0.660		
Ld/Lq	Electrical inductance (*)	mH	22.6 / 17.5	5.65 / 4.39		
Isc	Maximum short-circuit current	Arms	21.3	42.6		
nb	Base speed	rpm	183	407		
nb,i	Base speed at intermittent duty cycle	rpm	137	317		
nb,p	Base speed at peak duty cycle	rpm	136	301		
nn	Rated speed	rpm	161	361		
Tn	Rated torque	Nm	513	497		
In	Rated current	Arms	26.6	51.2		
rth	Thermal time constant	s	127	127		
Rth	Thermal resistance	K/W	0.0269	0.0269		
2p	Number of poles	-	66	66		
J	Rotor inertia	kg·m²	0.265	0.265		
mr	Rotor mass	kg	16.2	16.2		
ms	Stator mass	kg	26.3	26.3		

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	0.087	0.087		
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	11	11		
Δpw	Max. pressure drop at qw	bar	0.4	0.4		

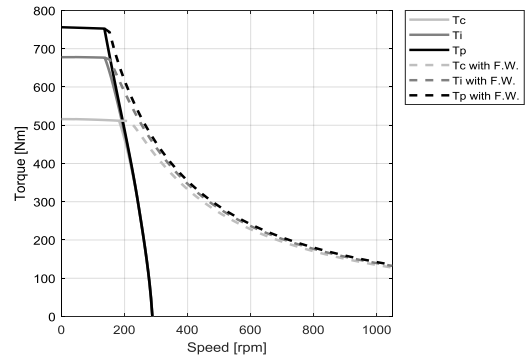
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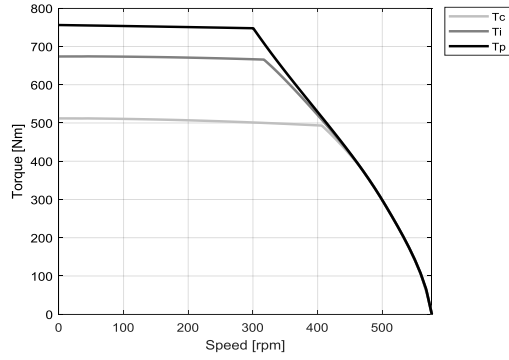
3UBN - WATER COOLING



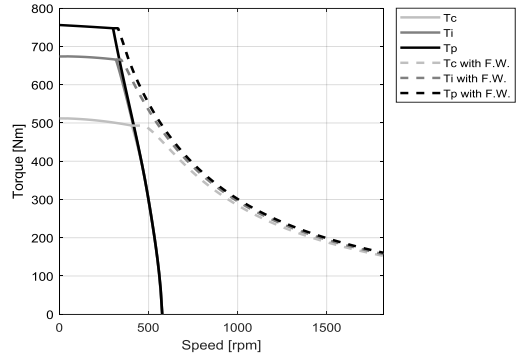
3UBN - WATER COOLING



3UDS - WATER COOLING



3UDS - WATER COOLING



MOTOR PERFORMANCE		Winding codes	3UCN	3UFS		
		UNIT	WATER COOLING	WATER COOLING		
Tp	Peak torque	Nm	1060	1060		
Ti	Intermittent torque	Nm	958	958		
Tc	Continuous torque	Nm	732	732		
Ts	Standstill torque	Nm	598	598		
Ip	Peak current	Arms	71.1	142		
Ii	Intermittent current	Arms	65.2	130		
Ic	Continuous current	Arms	41.3	82.5		
Is	Standstill current	Arms	31.3	62.5		
ns	Rated low speed	rpm	0.15	0.15		
nm	Maximum speed without flux weakening	rpm	309	618		
nm,FW	Maximum speed with flux weakening	rpm	1120	1820		
ton,p	Maximum ON time for peak cycle	s	39	39		
ton,i	Maximum ON time for intermittent cycle	s	2.9	2.9		
Pp	Power dissipation @ Ip	W	11500	11500		
Pi	Power dissipation @ Ii	W	13200	13200		
Pc	Power dissipation @ Ic	W	5260	5260		
Td	Max. detent torque (average to peak)	Nm	4.2	4.2		

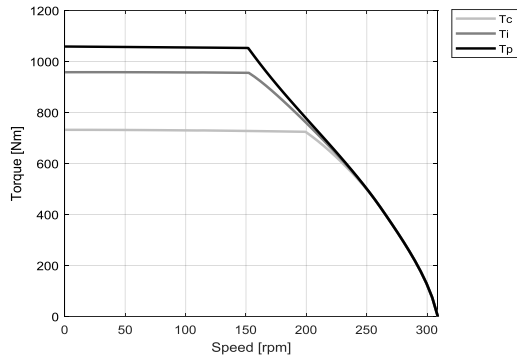
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	22.2	11.1		
Ku	Back EMF constant (*)	Vrms/(rad/s)	12.9	6.43		
Km	Motor constant	Nm/√W	15.1	15.1		
R20	Electrical resistance at 20°C (*)	Ohm	1.44	0.360		
Ld/Lq	Electrical inductance (*)	mH	13.8 / 10.9	3.44 / 2.72		
Isc	Maximum short-circuit current	Arms	32.7	65.3		
nb	Base speed	rpm	199	437		
nb,i	Base speed at intermittent duty cycle	rpm	152	342		
nb,p	Base speed at peak duty cycle	rpm	152	329		
nn	Rated speed	rpm	176	388		
Tn	Rated torque	Nm	726	705		
In	Rated current	Arms	40.8	78.8		
rth	Thermal time constant	s	118	118		
Rth	Thermal resistance	K/W	0.0204	0.0204		
2p	Number of poles	-	66	66		
J	Rotor inertia	kg·m²	0.347	0.347		
mr	Rotor mass	kg	21.1	21.1		
ms	Stator mass	kg	32.7	32.7		

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	0.102	0.102		
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	15	15		
Δpw	Max. pressure drop at qw	bar	0.6	0.6		

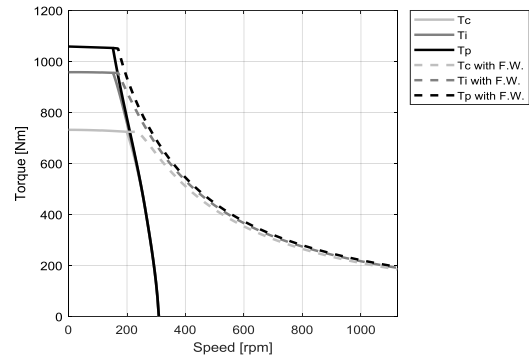
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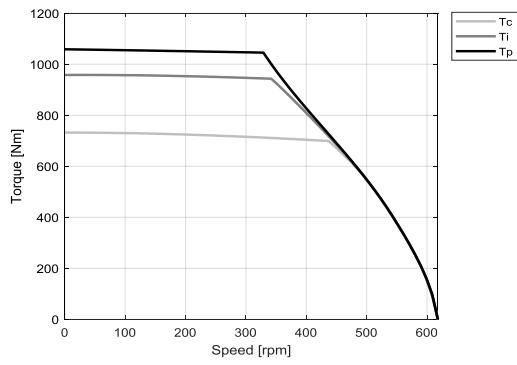
3UCN - WATER COOLING



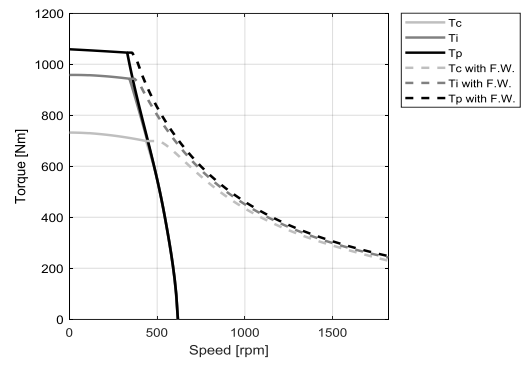
3UCN - WATER COOLING



3UFS - WATER COOLING



3UFS - WATER COOLING



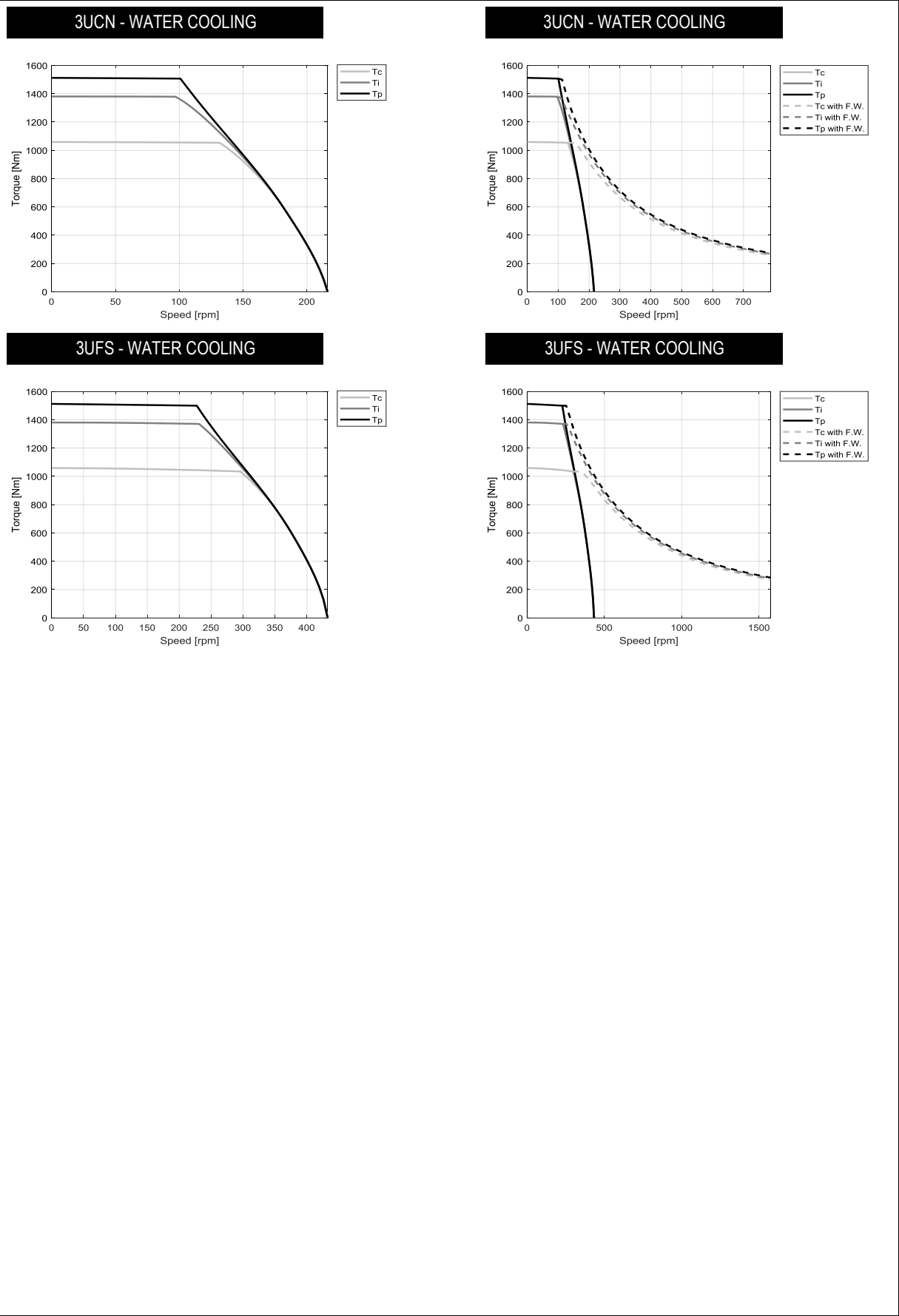
MOTOR PERFORMANCE		Winding codes	3UCN	3UFS		
		UNIT	WATER COOLING	WATER COOLING		
Tp	Peak torque	Nm	1510	1510		
Ti	Intermittent torque	Nm	1380	1380		
Tc	Continuous torque	Nm	1060	1060		
Ts	Standstill torque	Nm	867	867		
Ip	Peak current	Arms	71.1	142		
Ii	Intermittent current	Arms	66.7	133		
Ic	Continuous current	Arms	42.2	84.4		
Is	Standstill current	Arms	32.0	63.9		
ns	Rated low speed	rpm	0.17	0.17		
nm	Maximum speed without flux weakening	rpm	216	433		
nm,FW	Maximum speed with flux weakening	rpm	787	1570		
ton,p	Maximum ON time for peak cycle	s	37	37		
ton,i	Maximum ON time for intermittent cycle	s	2.8	2.8		
Pp	Power dissipation @ Ip	W	15400	15400		
Pi	Power dissipation @ Ii	W	18300	18300		
Pc	Power dissipation @ Ic	W	7340	7340		
Td	Max. detent torque (average to peak)	Nm	6.0	6.0		

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	31.7	15.8		
Ku	Back EMF constant (*)	Vrms/(rad/s)	18.4	9.18		
Km	Motor constant	Nm/√W	18.7	18.7		
R20	Electrical resistance at 20°C (*)	Ohm	1.92	0.480		
Ld/Lq	Electrical inductance (*)	mH	19.4 / 15.1	4.84 / 3.78		
Isc	Maximum short-circuit current	Arms	33.2	66.4		
nb	Base speed	rpm	132	296		
nb,i	Base speed at intermittent duty cycle	rpm	97.0	231		
nb,p	Base speed at peak duty cycle	rpm	101	227		
nn	Rated speed	rpm	115	263		
Tn	Rated torque	Nm	1050	1040		
In	Rated current	Arms	41.9	82.4		
rth	Thermal time constant	s	106	106		
Rth	Thermal resistance	K/W	0.0147	0.0147		
2p	Number of poles	-	66	66		
J	Rotor inertia	kg·m²	0.469	0.469		
mr	Rotor mass	kg	28.4	28.4		
ms	Stator mass	kg	41.4	41.4		

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	0.124	0.124		
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	21	21		
Δpw	Max. pressure drop at qw	bar	1.1	1.1		

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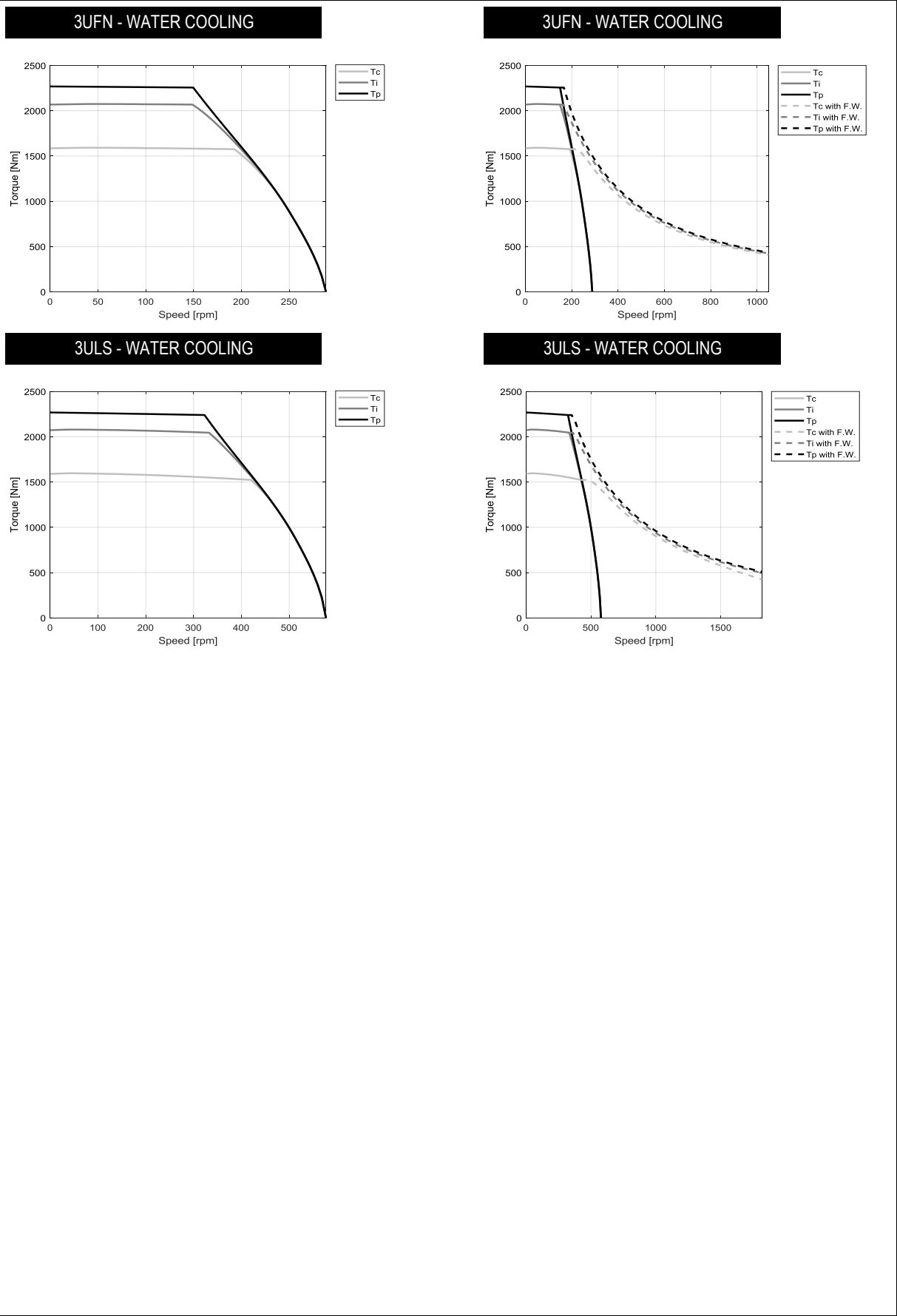
MOTOR PERFORMANCE		Winding codes	3UFN	3ULS		
		UNIT	WATER COOLING	WATER COOLING		
Tp	Peak torque	Nm	2270	2270		
Ti	Intermittent torque	Nm	2070	2070		
Tc	Continuous torque	Nm	1580	1590		
Ts	Standstill torque	Nm	1300	1300		
Ip	Peak current	Arms	142	285		
Ii	Intermittent current	Arms	133	267		
Ic	Continuous current	Arms	84.2	169		
Is	Standstill current	Arms	63.7	128		
ns	Rated low speed	rpm	0.18	0.18		
nm	Maximum speed without flux weakening	rpm	288	577		
nm,FW	Maximum speed with flux weakening	rpm	1050	1820		
ton,p	Maximum ON time for peak cycle	s	35	36		
ton,i	Maximum ON time for intermittent cycle	s	4.1	4.1		
Pp	Power dissipation @ Ip	W	21500	21300		
Pi	Power dissipation @ Ii	W	25400	25400		
Pc	Power dissipation @ Ic	W	10100	10100		
Td	Max. detent torque (average to peak)	Nm	9.0	9.0		

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	23.8	11.9		
Ku	Back EMF constant (*)	Vrms/(rad/s)	13.8	6.89		
Km	Motor constant	Nm/√W	23.6	23.8		
R20	Electrical resistance at 20°C (*)	Ohm	0.673	0.167		
Ld/Lq	Electrical inductance (*)	mH	7.01 / 5.40	1.75 / 1.35		
Isc	Maximum short-circuit current	Arms	68.8	138		
nb	Base speed	rpm	192	420		
nb,i	Base speed at intermittent duty cycle	rpm	149	332		
nb,p	Base speed at peak duty cycle	rpm	150	323		
nn	Rated speed	rpm	170	374		
Tn	Rated torque	Nm	1580	1540		
In	Rated current	Arms	84.0	163		
rth	Thermal time constant	s	101	101		
Rth	Thermal resistance	K/W	0.0103	0.0103		
2p	Number of poles	-	66	66		
J	Rotor inertia	kg·m²	0.674	0.674		
mr	Rotor mass	kg	40.7	40.7		
ms	Stator mass	kg	57.7	57.7		

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	0.162	0.162		
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	29	29		
Δpw	Max. pressure drop at qw	bar	2.1	2.1		

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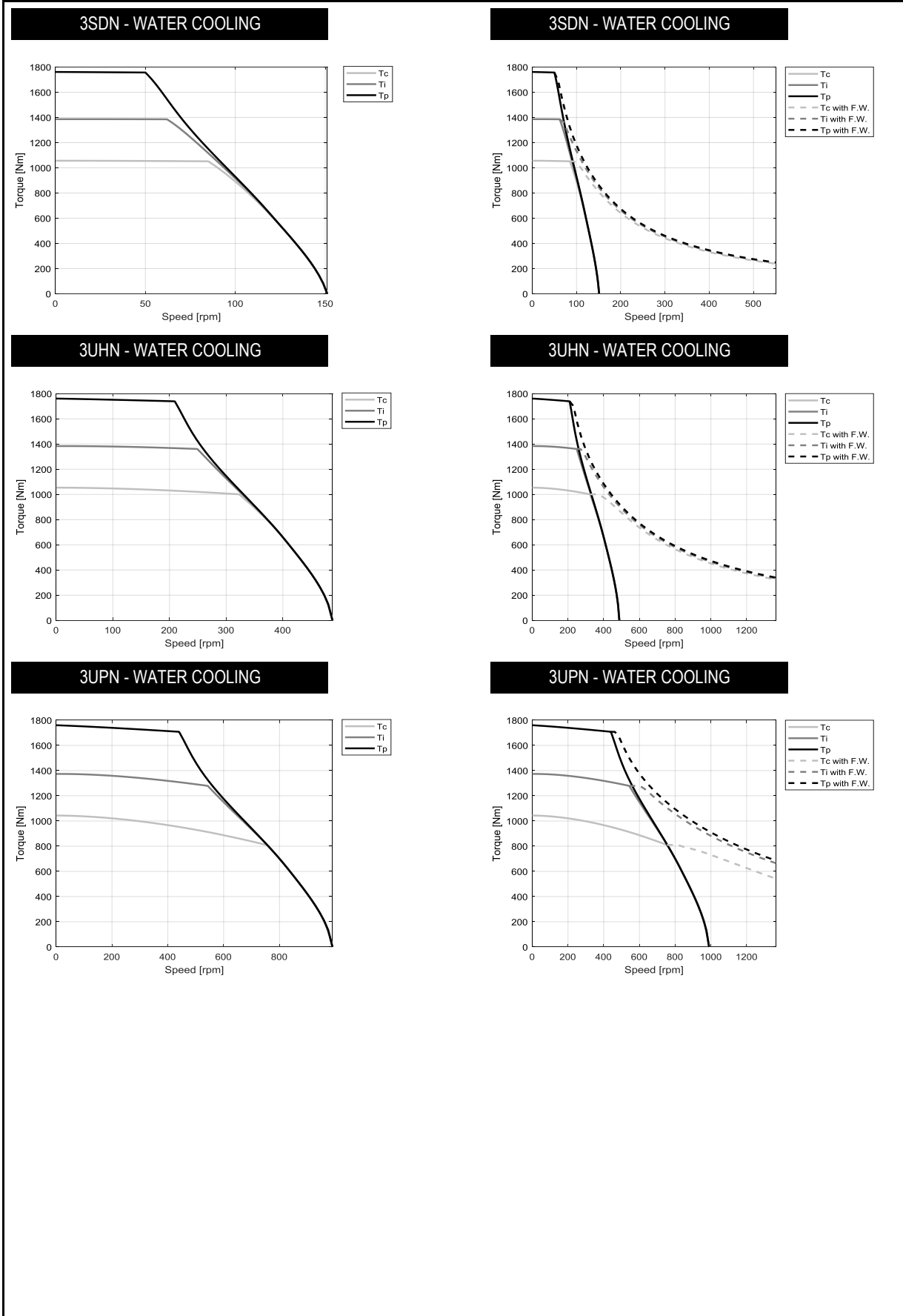
MOTOR PERFORMANCE		Winding codes	3SDN	3UHN	3UPN	
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	
Tp	Peak torque	Nm	1760	1760	1760	
Ti	Intermittent torque	Nm	1390	1380	1370	
Tc	Continuous torque	Nm	1060	1050	1040	
Ts	Standstill torque	Nm	859	856	846	
Ip	Peak current	Arms	70.0	226	458	
Ii	Intermittent current	Arms	44.0	141	283	
Ic	Continuous current	Arms	27.8	89.4	179	
Is	Standstill current	Arms	21.1	67.7	136	
ns	Rated low speed	rpm	0.074	0.074	0.075	
nm	Maximum speed without flux weakening	rpm	151	487	990	
nm,FW	Maximum speed with flux weakening	rpm	551	1360	1360	
ton,p	Maximum ON time for peak cycle	s	21	21	20	
ton,i	Maximum ON time for intermittent cycle	s	3.1	3.1	3.1	
Pp	Power dissipation @ Ip	W	23800	24000	24800	
Pi	Power dissipation @ Ii	W	12100	12100	12100	
Pc	Power dissipation @ Ic	W	4840	4840	4840	
Td	Max. detent torque (average to peak)	Nm	7.0	7.0	7.0	

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	45.4	14.1	6.94	
Ku	Back EMF constant (*)	Vrms/(rad/s)	26.3	8.15	4.01	
Km	Motor constant	Nm/√W	21.7	21.6	21.3	
R20	Electrical resistance at 20°C (*)	Ohm	2.91	0.283	0.0705	
Ld/Lq	Electrical inductance (*)	mH	34.7 / 28.4	3.34 / 2.73	0.810 / 0.664	
Isc	Maximum short-circuit current	Arms	19.9	64.0	130	
nb	Base speed	rpm	85.0	323	754	
nb,i	Base speed at intermittent duty cycle	rpm	62.0	249	543	
nb,p	Base speed at peak duty cycle	rpm	50.0	209	440	
nn	Rated speed	rpm	74.5	287	657	
Tn	Rated torque	Nm	1050	1010	860	
In	Rated current	Arms	27.7	85.0	143	
rth	Thermal time constant	s	183	184	183	
Rth	Thermal resistance	K/W	0.0222	0.0222	0.0222	
2p	Number of poles	-	88	88	88	
J	Rotor inertia	kg·m²	1.37	1.37	1.37	
mr	Rotor mass	kg	33.1	33.1	33.1	
ms	Stator mass	kg	50.0	50.0	50.0	

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	0.147	0.147	0.147	
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	14	14	14	
Δpw	Max. pressure drop at qw	bar	0.4	0.4	0.4	

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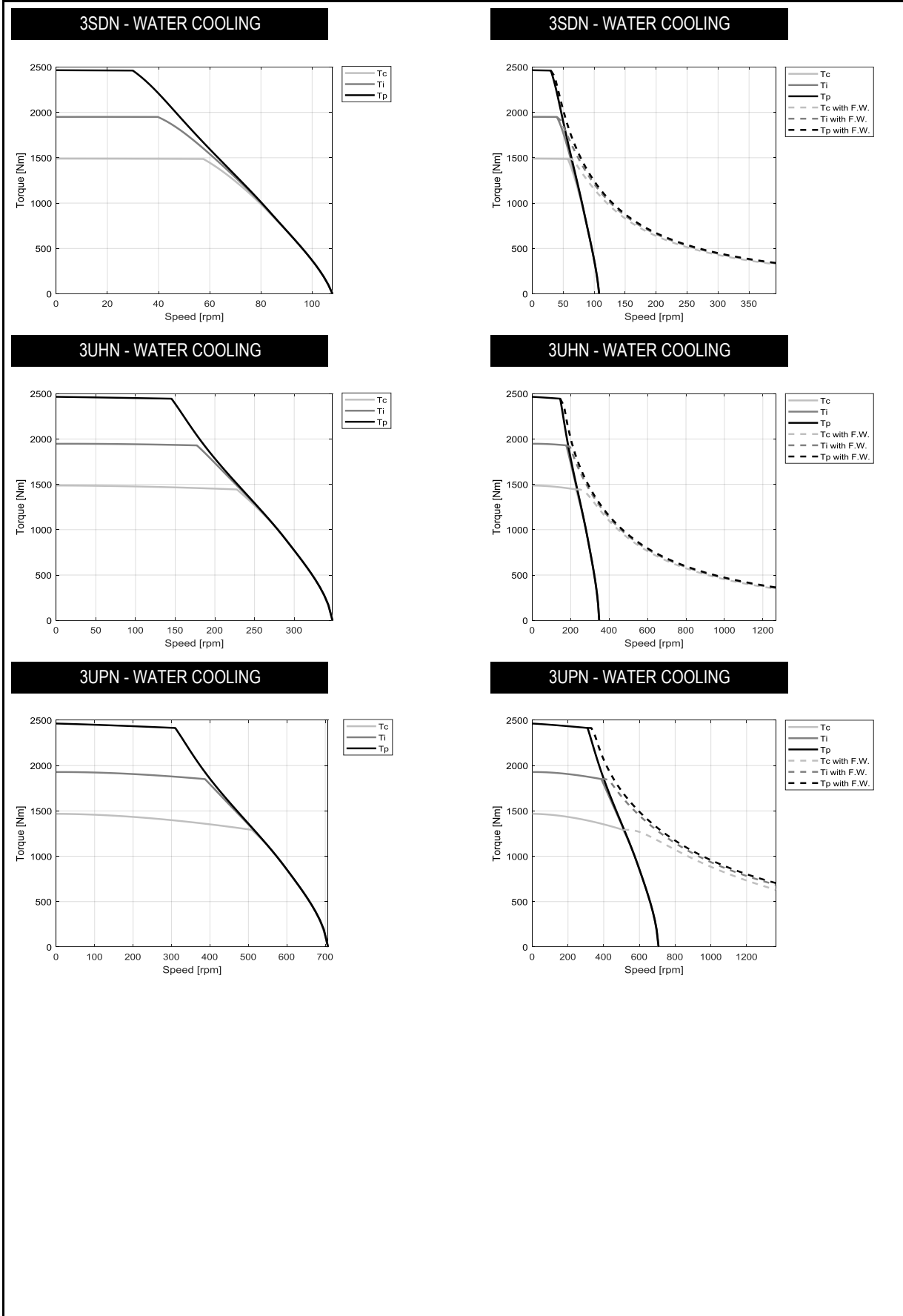
MOTOR PERFORMANCE		Winding codes	3SDN	3UHN	3UPN	
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	
Tp	Peak torque	Nm	2460	2460	2460	
Ti	Intermittent torque	Nm	1950	1950	1930	
Tc	Continuous torque	Nm	1490	1490	1470	
Ts	Standstill torque	Nm	1210	1210	1190	
Ip	Peak current	Arms	70.0	226	458	
Ii	Intermittent current	Arms	44.7	144	286	
Ic	Continuous current	Arms	28.3	90.8	181	
Is	Standstill current	Arms	21.4	68.8	137	
ns	Rated low speed	rpm	0.081	0.081	0.081	
nm	Maximum speed without flux weakening	rpm	108	348	707	
nm,FW	Maximum speed with flux weakening	rpm	393	1270	1360	
ton,p	Maximum ON time for peak cycle	s	19	19	18	
ton,i	Maximum ON time for intermittent cycle	s	3.0	3.0	3.0	
Pp	Power dissipation @ Ip	W	30100	30300	31600	
Pi	Power dissipation @ Ii	W	15800	15800	15800	
Pc	Power dissipation @ Ic	W	6320	6320	6320	
Td	Max. detent torque (average to peak)	Nm	9.8	9.8	9.8	

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	63.6	19.7	9.72	
Ku	Back EMF constant (*)	Vrms/(rad/s)	36.8	11.4	5.62	
Km	Motor constant	Nm/√W	27.0	26.9	26.4	
R20	Electrical resistance at 20°C (*)	Ohm	3.69	0.357	0.0900	
Ld/Lq	Electrical inductance (*)	mH	47.8 / 38.4	4.60 / 3.70	1.12 / 0.900	
Isc	Maximum short-circuit current	Arms	20.2	65.1	132	
nb	Base speed	rpm	57.5	228	509	
nb,i	Base speed at intermittent duty cycle	rpm	39.7	177	387	
nb,p	Base speed at peak duty cycle	rpm	30.0	145	310	
nn	Rated speed	rpm	49.8	203	450	
Tn	Rated torque	Nm	1490	1450	1330	
In	Rated current	Arms	28.1	88.0	160	
rth	Thermal time constant	s	168	169	168	
Rth	Thermal resistance	K/W	0.0170	0.0170	0.0170	
2p	Number of poles	-	88	88	88	
J	Rotor inertia	kg·m²	1.77	1.77	1.77	
mr	Rotor mass	kg	42.7	42.7	42.7	
ms	Stator mass	kg	61.9	62.0	61.9	

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	0.172	0.172	0.172	
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	0.6	0.6	0.6	

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MOTOR PERFORMANCE		Winding codes	3SDN	3UHN	3UPN	
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	
Tp	Peak torque	Nm	3520	3520	3520	
Ti	Intermittent torque	Nm	2810	2800	2770	
Tc	Continuous torque	Nm	2160	2150	2120	
Ts	Standstill torque	Nm	1760	1750	1720	
Ip	Peak current	Arms	70.0	226	458	
Ii	Intermittent current	Arms	45.7	146	291	
Ic	Continuous current	Arms	28.9	92.4	184	
Is	Standstill current	Arms	21.9	70.0	139	
ns	Rated low speed	rpm	0.091	0.091	0.092	
nm	Maximum speed without flux weakening	rpm	75.6	244	495	
nm,FW	Maximum speed with flux weakening	rpm	275	887	1360	
ton,p	Maximum ON time for peak cycle	s	17	17	16	
ton,i	Maximum ON time for intermittent cycle	s	3.0	3.0	3.0	
Pp	Power dissipation @ Ip	W	39500	40200	42000	
Pi	Power dissipation @ Ii	W	21800	21800	21800	
Pc	Power dissipation @ Ic	W	8730	8720	8720	
Td	Max. detent torque (average to peak)	Nm	14	14	14	

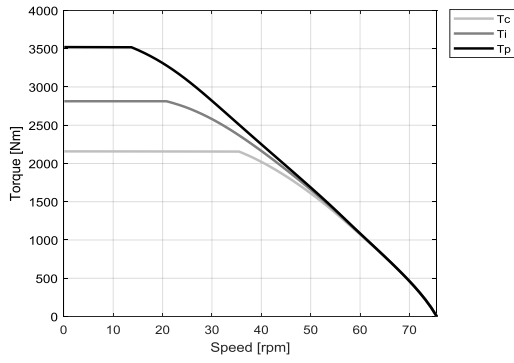
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	90.8	28.2	13.9	
Ku	Back EMF constant (*)	Vrms/(rad/s)	52.5	16.3	8.03	
Km	Motor constant	Nm/√W	33.6	33.4	32.7	
R20	Electrical resistance at 20°C (*)	Ohm	4.86	0.475	0.120	
Ld/Lq	Electrical inductance (*)	mH	66.8 / 53.5	6.43 / 5.16	1.56 / 1.25	
Isc	Maximum short-circuit current	Arms	20.6	66.5	135	
nb	Base speed	rpm	35.5	155	342	
nb,i	Base speed at intermittent duty cycle	rpm	20.8	120	266	
nb,p	Base speed at peak duty cycle	rpm	13.7	99.6	217	
nn	Rated speed	rpm	29.9	138	304	
Tn	Rated torque	Nm	2160	2120	2010	
In	Rated current	Arms	28.9	90.8	173	
rth	Thermal time constant	s	149	150	149	
Rth	Thermal resistance	K/W	0.0123	0.0123	0.0123	
2p	Number of poles	-	88	88	88	
J	Rotor inertia	kg·m²	2.37	2.37	2.37	
mr	Rotor mass	kg	56.8	56.8	56.8	
ms	Stator mass	kg	78.4	78.4	78.3	

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	0.209	0.209	0.209	
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	25	25	25	
Δpw	Max. pressure drop at qw	bar	1.2	1.2	1.2	

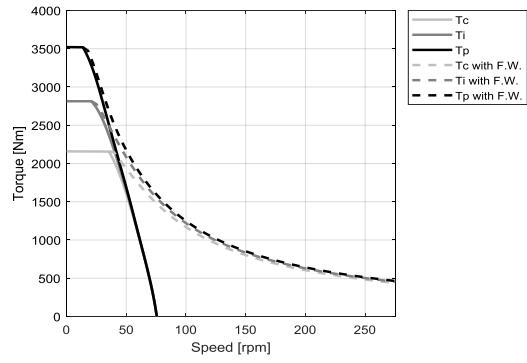
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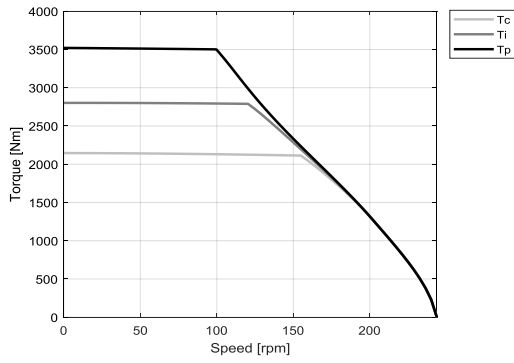
3SDN - WATER COOLING



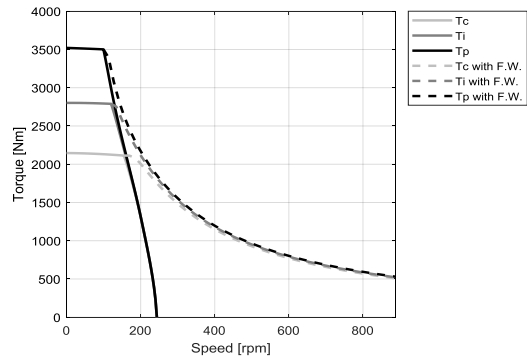
3SDN - WATER COOLING



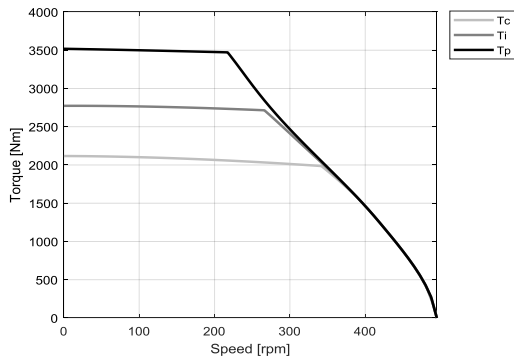
3UHN - WATER COOLING



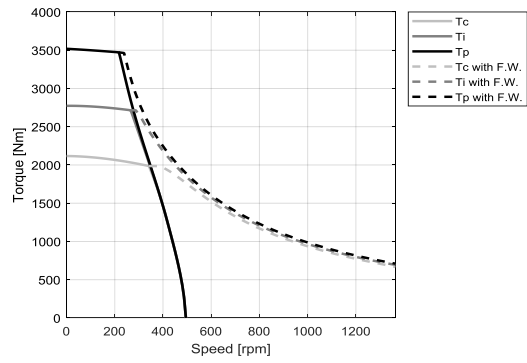
3UHN - WATER COOLING



3UPN - WATER COOLING



3UPN - WATER COOLING



MOTOR PERFORMANCE		Winding codes	3SDN	3UHN	3UPN	
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	
Tp	Peak torque	Nm	5140	5280	5280	
Ti	Intermittent torque	Nm	4230	4210	4180	
Tc	Continuous torque	Nm	3250	3230	3200	
Ts	Standstill torque	Nm	2650	2630	2610	
Ip	Peak current	Arms	64.7	226	458	
Ii	Intermittent current	Arms	46.1	147	296	
Ic	Continuous current	Arms	29.2	93.1	187	
Is	Standstill current	Arms	22.1	70.6	142	
ns	Rated low speed	rpm	0.097	0.097	0.097	
nm	Maximum speed without flux weakening	rpm	50.3	163	330	
nm,FW	Maximum speed with flux weakening	rpm	184	592	1200	
ton,p	Maximum ON time for peak cycle	s	20	15	14	
ton,i	Maximum ON time for intermittent cycle	s	3.0	3.0	2.9	
Pp	Power dissipation @ Ip	W	46500	56100	57500	
Pi	Power dissipation @ Ii	W	31000	31000	31000	
Pc	Power dissipation @ Ic	W	12400	12400	12400	
Td	Max. detent torque (average to peak)	Nm	21	21	21	

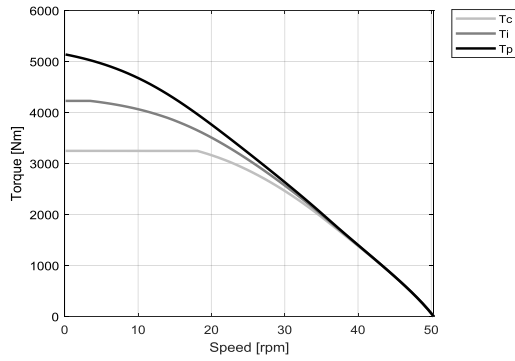
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	136	42.3	20.8	
Ku	Back EMF constant (*)	Vrms/(rad/s)	78.8	24.4	12.0	
Km	Motor constant	Nm/√W	42.7	42.3	41.8	
R20	Electrical resistance at 20°C (*)	Ohm	6.80	0.665	0.165	
Ld/Lq	Electrical inductance (*)	mH	96.7 / 77.4	9.30 / 7.45	2.26 / 1.81	
Isc	Maximum short-circuit current	Arms	21.4	69.0	140	
nb	Base speed	rpm	18.1	100	223	
nb,i	Base speed at intermittent duty cycle	rpm	3.47	76.5	175	
nb,p	Base speed at peak duty cycle	rpm	0.00	63.2	145	
nn	Rated speed	rpm	14.1	88.4	198	
Tn	Rated torque	Nm	3250	3210	3120	
In	Rated current	Arms	29.1	92.2	181	
rth	Thermal time constant	s	141	141	140	
Rth	Thermal resistance	K/W	0.00866	0.00868	0.00868	
2p	Number of poles	-	88	88	88	
J	Rotor inertia	kg·m²	3.37	3.37	3.37	
mr	Rotor mass	kg	80.6	80.6	80.6	
ms	Stator mass	kg	108	108	108	

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	0.271	0.271	0.271	
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	36	36	36	
Δpw	Max. pressure drop at qw	bar	2.2	2.2	2.2	

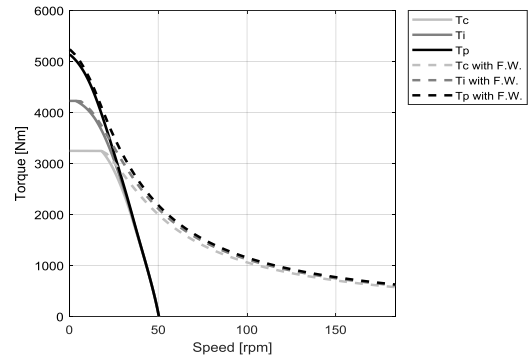
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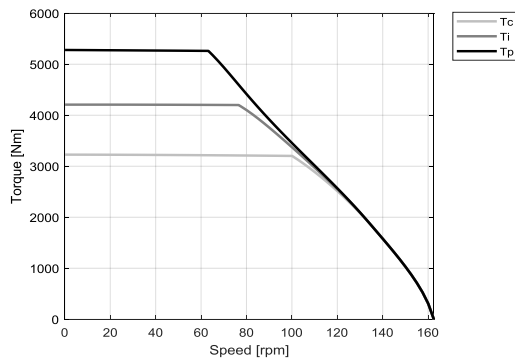
3SDN - WATER COOLING



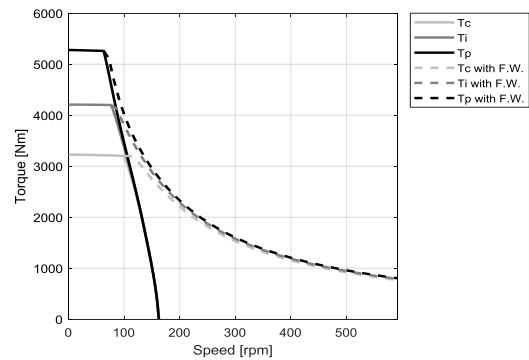
3SDN - WATER COOLING



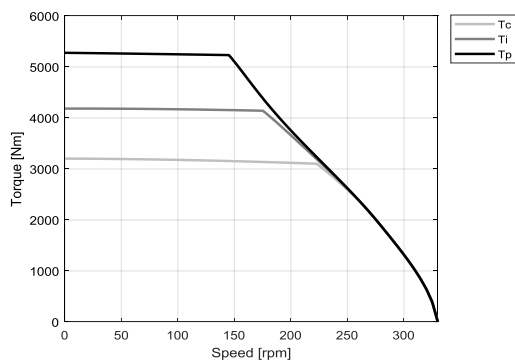
3UHN - WATER COOLING



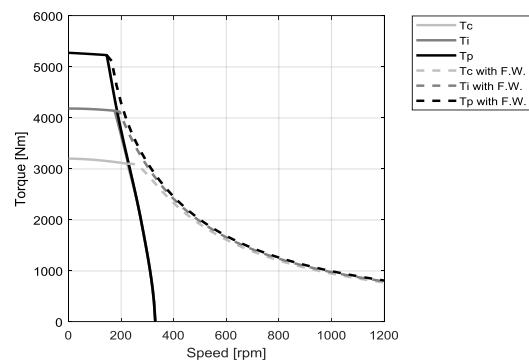
3UHN - WATER COOLING



3UPN - WATER COOLING



3UPN - WATER COOLING



MOTOR PERFORMANCE		Winding codes	3SLN	3ULN	3UXN	
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	
Tp	Peak torque	Nm	3950	3950	3940	
Ti	Intermittent torque	Nm	2930	2930	2910	
Tc	Continuous torque	Nm	2220	2210	2190	
Ts	Standstill torque	Nm	1790	1790	1770	
Ip	Peak current	Arms	243	392	796	
Ii	Intermittent current	Arms	128	205	411	
Ic	Continuous current	Arms	80.8	130	260	
Is	Standstill current	Arms	61.2	98.3	197	
ns	Rated low speed	rpm	0.042	0.042	0.042	
nm	Maximum speed without flux weakening	rpm	215	347	704	
nm,FW	Maximum speed with flux weakening	rpm	784	909	909	
ton,p	Maximum ON time for peak cycle	s	15	14	14	
ton,i	Maximum ON time for intermittent cycle	s	3.1	3.1	3.1	
Pp	Power dissipation @ Ip	W	50200	50600	52300	
Pi	Power dissipation @ Ii	W	17000	17000	17000	
Pc	Power dissipation @ Ic	W	6810	6810	6810	
Td	Max. detent torque (average to peak)	Nm	11	11	11	

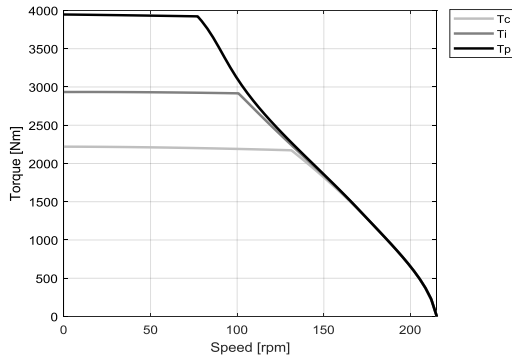
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	31.9	19.8	9.75	
Ku	Back EMF constant (*)	Vrms/(rad/s)	18.4	11.4	5.64	
Km	Motor constant	Nm/√W	37.4	37.3	36.7	
R20	Electrical resistance at 20°C (*)	Ohm	0.486	0.188	0.0470	
Ld/Lq	Electrical inductance (*)	mH	5.82 / 4.83	2.24 / 1.86	0.543 / 0.452	
Isc	Maximum short-circuit current	Arms	55.4	89.4	181	
nb	Base speed	rpm	131	224	531	
nb,i	Base speed at intermittent duty cycle	rpm	101	171	373	
nb,p	Base speed at peak duty cycle	rpm	77.2	133	281	
nn	Rated speed	rpm	117	199	460	
Tn	Rated torque	Nm	2180	2110	1760	
In	Rated current	Arms	79.0	123	203	
rth	Thermal time constant	s	216	216	216	
Rth	Thermal resistance	K/W	0.0158	0.0158	0.0158	
2p	Number of poles	-	132	132	132	
J	Rotor inertia	kg·m²	5.81	5.81	5.81	
mr	Rotor mass	kg	58.5	58.5	58.5	
ms	Stator mass	kg	100	100	100	

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	0.328	0.328	0.328	
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	0.7	0.7	0.7	

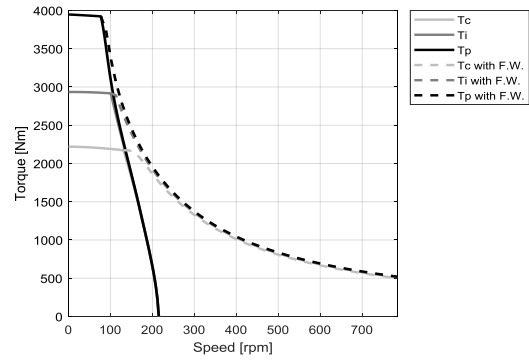
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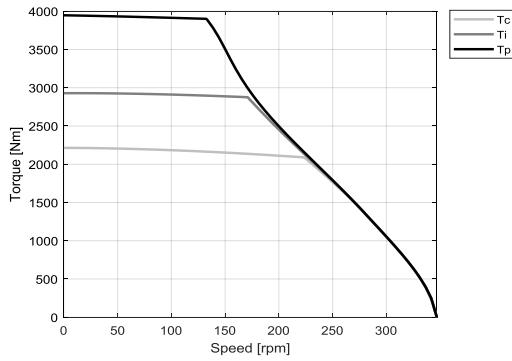
3SLN - WATER COOLING



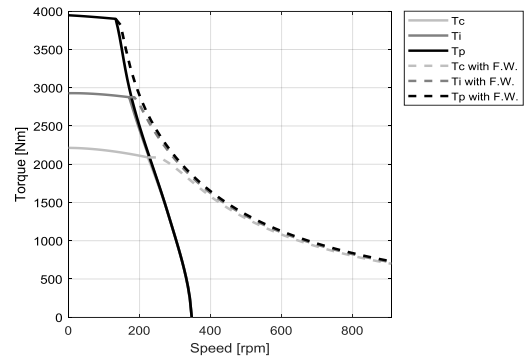
3SLN - WATER COOLING



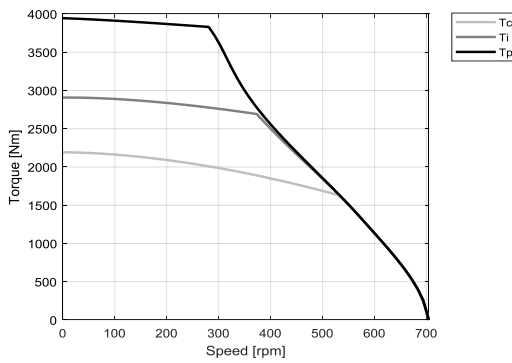
3JLN - WATER COOLING



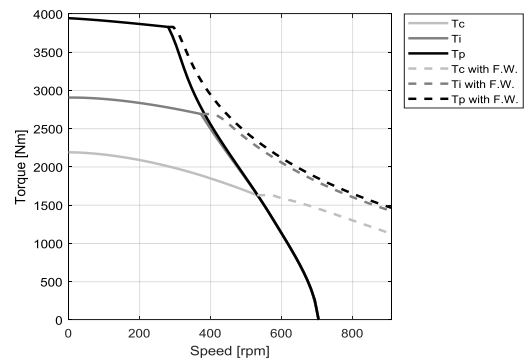
3JLN - WATER COOLING



3UXN - WATER COOLING



3UXN - WATER COOLING



MOTOR PERFORMANCE		Winding codes	3SLN	3ULN	3UXN	
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	
Tp	Peak torque	Nm	5530	5530	5520	
Ti	Intermittent torque	Nm	4130	4120	4080	
Tc	Continuous torque	Nm	3130	3130	3080	
Ts	Standstill torque	Nm	2540	2530	2490	
Ip	Peak current	Arms	243	392	796	
Ii	Intermittent current	Arms	129	208	414	
Ic	Continuous current	Arms	81.9	132	262	
Is	Standstill current	Arms	62.0	99.7	199	
ns	Rated low speed	rpm	0.046	0.046	0.046	
nm	Maximum speed without flux weakening	rpm	154	248	503	
nm,FW	Maximum speed with flux weakening	rpm	560	902	909	
ton,p	Maximum ON time for peak cycle	s	13	13	12	
ton,i	Maximum ON time for intermittent cycle	s	3.0	3.0	3.0	
Pp	Power dissipation @ Ip	W	63300	63800	66600	
Pi	Power dissipation @ Ii	W	22100	22100	22100	
Pc	Power dissipation @ Ic	W	8850	8850	8850	
Td	Max. detent torque (average to peak)	Nm	15	15	15	

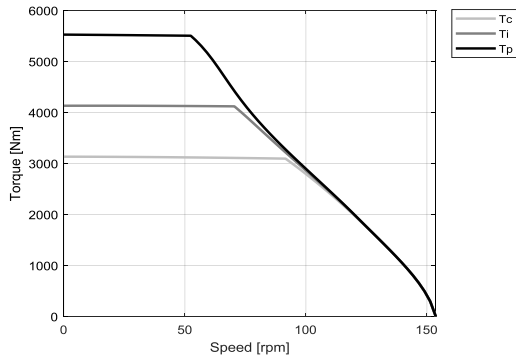
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	44.7	27.7	13.7	
Ku	Back EMF constant (*)	Vrms/(rad/s)	25.8	16.0	7.89	
Km	Motor constant	Nm/√W	46.5	46.4	45.5	
R20	Electrical resistance at 20°C (*)	Ohm	0.615	0.238	0.0600	
Ld/Lq	Electrical inductance (*)	mH	7.93 / 6.62	3.05 / 2.55	0.741 / 0.620	
Isc	Maximum short-circuit current	Arms	57.0	91.8	186	
nb	Base speed	rpm	91.6	156	351	
nb,i	Base speed at intermittent duty cycle	rpm	70.5	121	264	
nb,p	Base speed at peak duty cycle	rpm	52.5	92.9	200	
nn	Rated speed	rpm	81.2	139	310	
Tn	Rated torque	Nm	3100	3040	2760	
In	Rated current	Arms	80.7	127	230	
rth	Thermal time constant	s	197	198	197	
Rth	Thermal resistance	K/W	0.0122	0.0122	0.0122	
2p	Number of poles	-	132	132	132	
J	Rotor inertia	kg·m²	7.47	7.47	7.47	
mr	Rotor mass	kg	74.9	74.9	74.9	
ms	Stator mass	kg	120	120	120	

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	0.407	0.407	0.407	
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	25	25	25	
Δpw	Max. pressure drop at qw	bar	1.0	1.0	1.0	

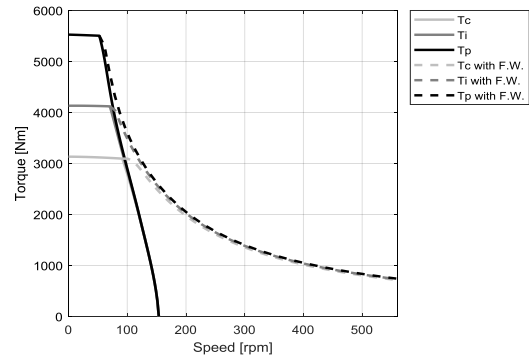
Notes: (*) terminal to terminal.
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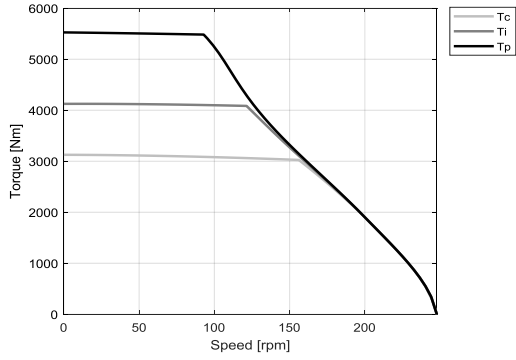
3SLN - WATER COOLING



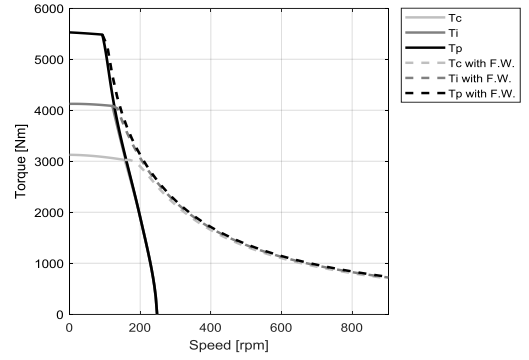
3SLN - WATER COOLING



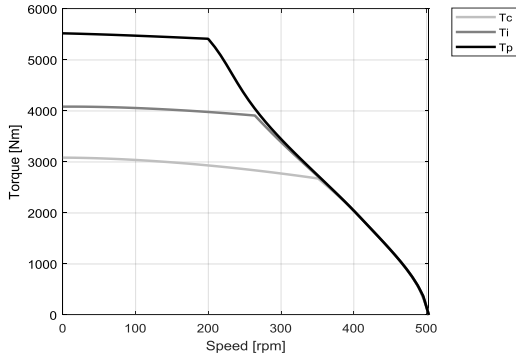
3JLN - WATER COOLING



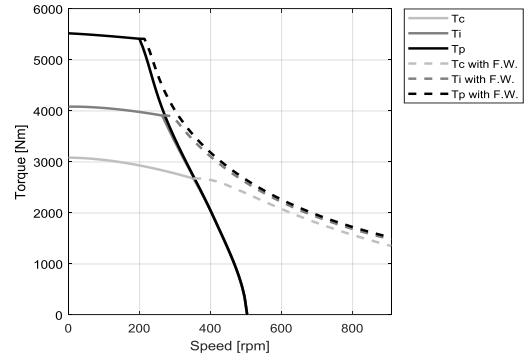
3JLN - WATER COOLING



3JXN - WATER COOLING



3JXN - WATER COOLING



MOTOR PERFORMANCE		Winding codes	3SLN	3ULN	3UXN	
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	
Tp	Peak torque	Nm	7900	7890	7890	
Ti	Intermittent torque	Nm	5940	5920	5850	
Tc	Continuous torque	Nm	4520	4490	4430	
Ts	Standstill torque	Nm	3660	3640	3580	
Ip	Peak current	Arms	243	392	796	
Ii	Intermittent current	Arms	131	210	418	
Ic	Continuous current	Arms	83.1	133	264	
Is	Standstill current	Arms	63.0	101	200	
ns	Rated low speed	rpm	0.051	0.051	0.051	
nm	Maximum speed without flux weakening	rpm	108	173	352	
nm,FW	Maximum speed with flux weakening	rpm	392	632	909	
ton,p	Maximum ON time for peak cycle	s	11	11	10	
ton,i	Maximum ON time for intermittent cycle	s	3.0	3.0	3.0	
Pp	Power dissipation @ Ip	W	83000	84500	88500	
Pi	Power dissipation @ Ii	W	30000	30000	30000	
Pc	Power dissipation @ Ic	W	12000	12000	12000	
Td	Max. detent torque (average to peak)	Nm	21	21	21	

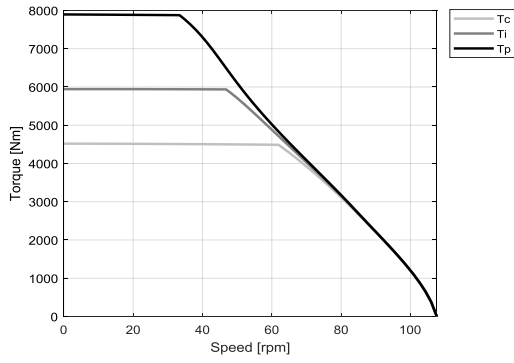
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	63.8	39.6	19.5	
Ku	Back EMF constant (*)	Vrms/(rad/s)	36.9	22.9	11.3	
Km	Motor constant	Nm/√W	57.9	57.5	56.3	
R20	Electrical resistance at 20°C (*)	Ohm	0.810	0.317	0.0800	
Ld/Lq	Electrical inductance (*)	mH	11.0 / 9.19	4.25 / 3.54	1.03 / 0.862	
Isc	Maximum short-circuit current	Arms	58.5	94.3	191	
nb	Base speed	rpm	61.9	107	237	
nb,i	Base speed at intermittent duty cycle	rpm	46.8	83.3	183	
nb,p	Base speed at peak duty cycle	rpm	33.4	62.8	139	
nn	Rated speed	rpm	54.6	95.2	210	
Tn	Rated torque	Nm	4490	4430	4180	
In	Rated current	Arms	82.4	130	246	
rth	Thermal time constant	s	178	179	178	
Rth	Thermal resistance	K/W	0.00895	0.00896	0.00896	
2p	Number of poles	-	132	132	132	
J	Rotor inertia	kg·m²	9.89	9.89	9.89	
mr	Rotor mass	kg	98.9	98.9	98.9	
ms	Stator mass	kg	149	149	149	

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	0.524	0.524	0.524	
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	35	34	34	
Δpw	Max. pressure drop at qw	bar	2.0	2.0	2.0	

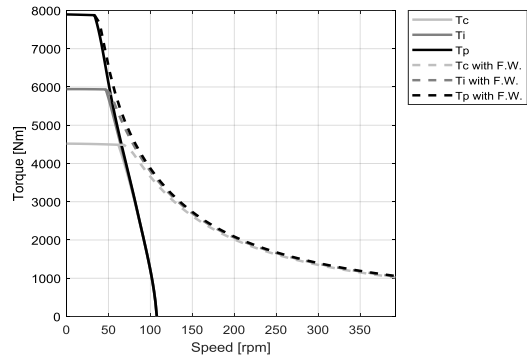
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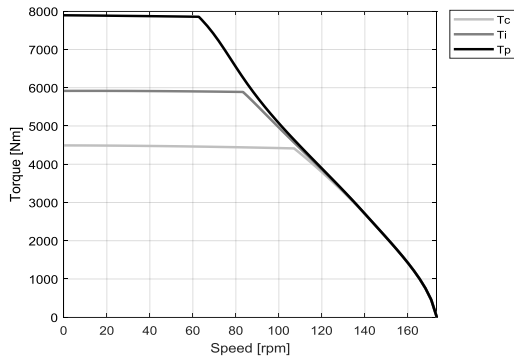
3SLN - WATER COOLING



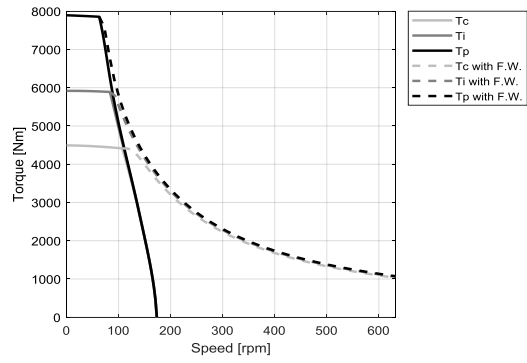
3SLN - WATER COOLING



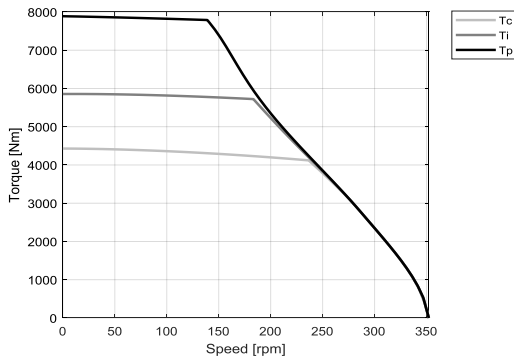
3JLN - WATER COOLING



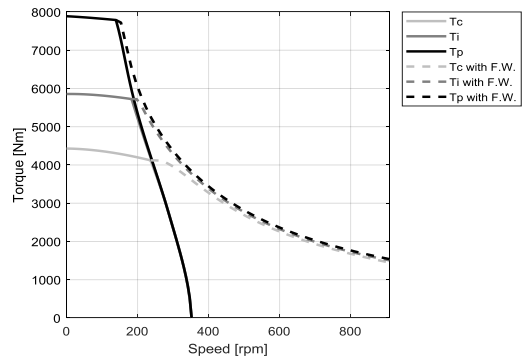
3JLN - WATER COOLING



3UXN - WATER COOLING



3UXN - WATER COOLING



MOTOR PERFORMANCE		Winding codes	3SLN	3ULN	3UXN	
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	
Tp	Peak torque	Nm	11800	11800	11800	
Ti	Intermittent torque	Nm	8880	8840	8790	
Tc	Continuous torque	Nm	6750	6710	6650	
Ts	Standstill torque	Nm	5470	5430	5380	
Ip	Peak current	Arms	243	392	796	
Ii	Intermittent current	Arms	131	209	420	
Ic	Continuous current	Arms	82.8	132	265	
Is	Standstill current	Arms	62.7	100	201	
ns	Rated low speed	rpm	0.051	0.051	0.051	
nm	Maximum speed without flux weakening	rpm	71.8	116	235	
nm,FW	Maximum speed with flux weakening	rpm	261	421	855	
ton,p	Maximum ON time for peak cycle	s	9.4	9.1	8.6	
ton,i	Maximum ON time for intermittent cycle	s	3.0	3.0	3.0	
Pp	Power dissipation @ Ip	W	117000	119000	122000	
Pi	Power dissipation @ Ii	W	41700	41600	41600	
Pc	Power dissipation @ Ic	W	16700	16600	16600	
Td	Max. detent torque (average to peak)	Nm	32	32	32	

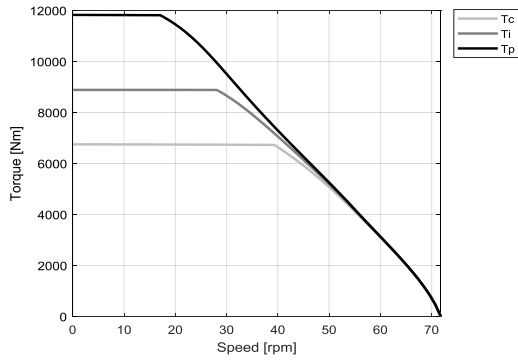
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	95.8	59.4	29.3	
Ku	Back EMF constant (*)	Vrms/(rad/s)	55.3	34.3	16.9	
Km	Motor constant	Nm/√W	73.5	72.9	72.0	
R20	Electrical resistance at 20°C (*)	Ohm	1.13	0.443	0.110	
Ld/Lq	Electrical inductance (*)	mH	16.0 / 13.2	6.17 / 5.11	1.50 / 1.24	
Isc	Maximum short-circuit current	Arms	60.4	97.3	198	
nb	Base speed	rpm	39.3	70.2	156	
nb,i	Base speed at intermittent duty cycle	rpm	28.1	53.7	122	
nb,p	Base speed at peak duty cycle	rpm	17.1	38.7	92.0	
nn	Rated speed	rpm	34.2	62.1	139	
Tn	Rated torque	Nm	6730	6660	6460	
In	Rated current	Arms	82.4	131	255	
rth	Thermal time constant	s	179	180	179	
Rth	Thermal resistance	K/W	0.00630	0.00632	0.00632	
2p	Number of poles	-	132	132	132	
J	Rotor inertia	kg·m²	14.0	14.0	14.0	
mr	Rotor mass	kg	140	140	140	
ms	Stator mass	kg	200	200	200	

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	0.720	0.720	0.720	
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	24	24	24	
Δpw	Max. pressure drop at qw	bar	1.0	1.0	1.0	

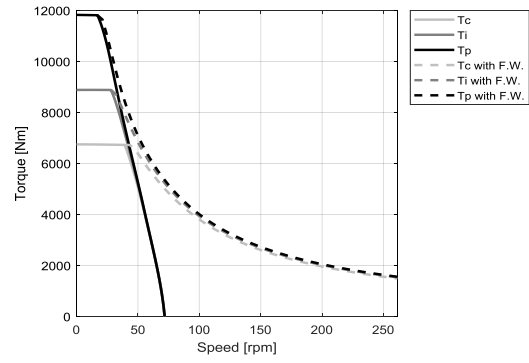
Notes: (*) terminal to terminal.
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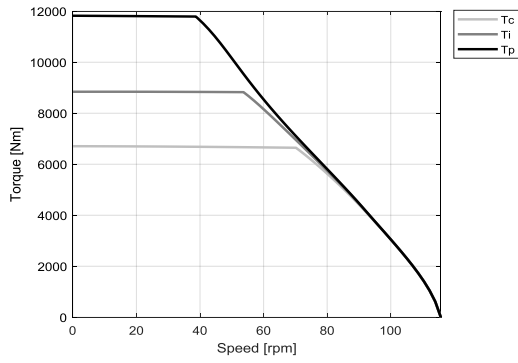
3SLN - WATER COOLING



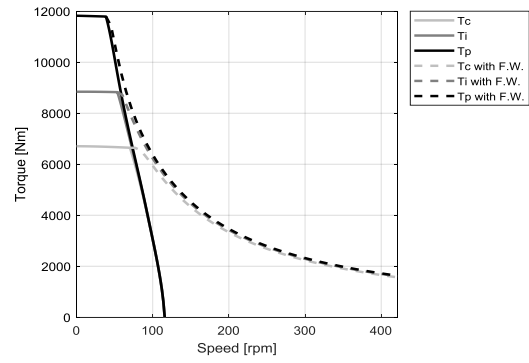
3SLN - WATER COOLING



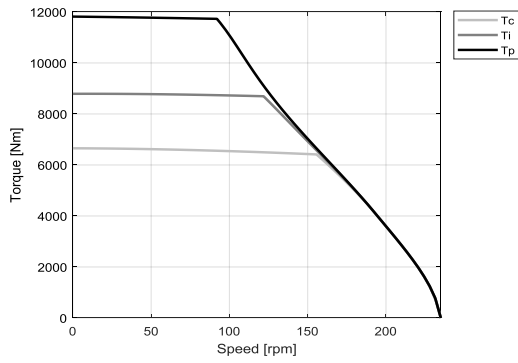
3JLN - WATER COOLING



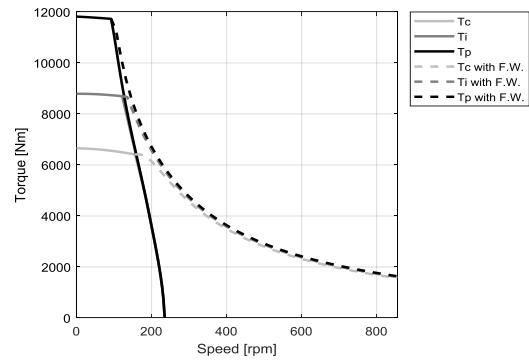
3JLN - WATER COOLING



3UXN - WATER COOLING



3UXN - WATER COOLING



MOTOR PERFORMANCE		Winding codes	3SPN	3UPN	3UZN	
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	
Tp	Peak torque	Nm	6940	6940	6930	
Ti	Intermittent torque	Nm	4850	4840	4800	
Tc	Continuous torque	Nm	3620	3610	3570	
Ts	Standstill torque	Nm	2890	2880	2840	
Ip	Peak current	Arms	357	575	1170	
Ii	Intermittent current	Arms	161	258	517	
Ic	Continuous current	Arms	102	163	327	
Is	Standstill current	Arms	77.1	124	248	
ns	Rated low speed	rpm	0.027	0.027	0.027	
nm	Maximum speed without flux weakening	rpm	170	273	555	
nm,FW	Maximum speed with flux weakening	rpm	618	682	682	
ton,p	Maximum ON time for peak cycle	s	8.7	8.6	8.0	
ton,i	Maximum ON time for intermittent cycle	s	3.1	3.1	3.1	
Pp	Power dissipation @ Ip	W	86000	86800	89800	
Pi	Power dissipation @ Ii	W	20200	20200	20200	
Pc	Power dissipation @ Ic	W	8090	8090	8090	
Td	Max. detent torque (average to peak)	Nm	14	14	14	

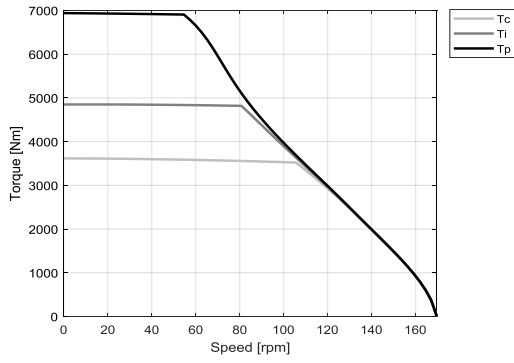
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	40.5	25.1	12.4	
Ku	Back EMF constant (*)	Vrms/(rad/s)	23.4	14.5	7.15	
Km	Motor constant	Nm/√W	54.8	54.6	53.8	
R20	Electrical resistance at 20°C (*)	Ohm	0.364	0.141	0.0353	
Ld/Lq	Electrical inductance (*)	mH	4.23 / 3.59	1.63 / 1.38	0.395 / 0.336	
Isc	Maximum short-circuit current	Arms	72.7	117	238	
nb	Base speed	rpm	106	180	439	
nb,i	Base speed at intermittent duty cycle	rpm	80.8	137	301	
nb,p	Base speed at peak duty cycle	rpm	54.6	95.0	202	
nn	Rated speed	rpm	93.9	160	379	
Tn	Rated torque	Nm	3540	3400	2650	
In	Rated current	Arms	99.0	153	238	
rth	Thermal time constant	s	249	250	249	
Rth	Thermal resistance	K/W	0.0133	0.0133	0.0133	
2p	Number of poles	-	176	176	176	
J	Rotor inertia	kg·m²	15.9	15.9	15.9	
mr	Rotor mass	kg	87.1	87.1	87.1	
ms	Stator mass	kg	147	147	147	

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	0.315	0.315	0.315	
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	23	23	23	
Δpw	Max. pressure drop at qw	bar	0.9	0.9	0.9	

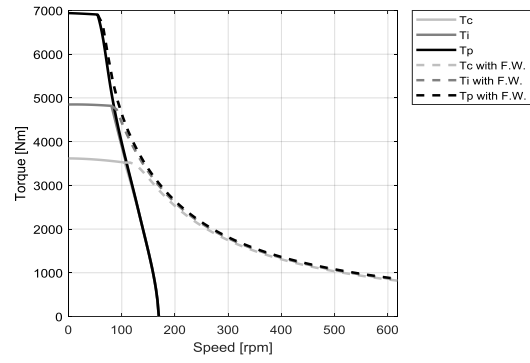
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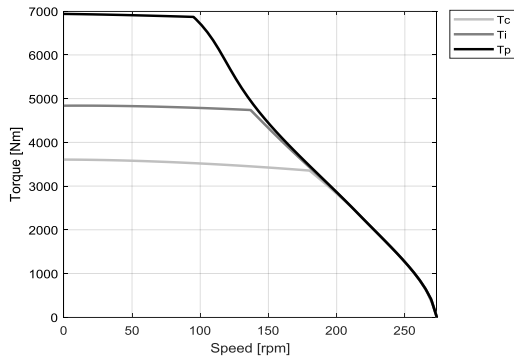
3SPN - WATER COOLING



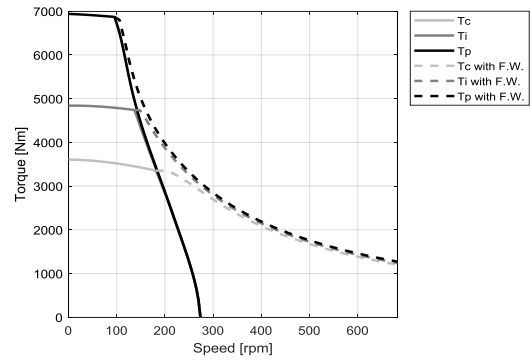
3SPN - WATER COOLING



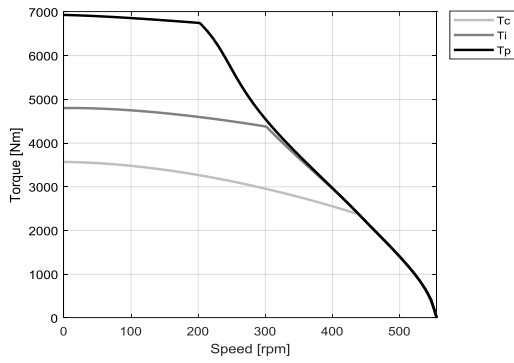
3UPN - WATER COOLING



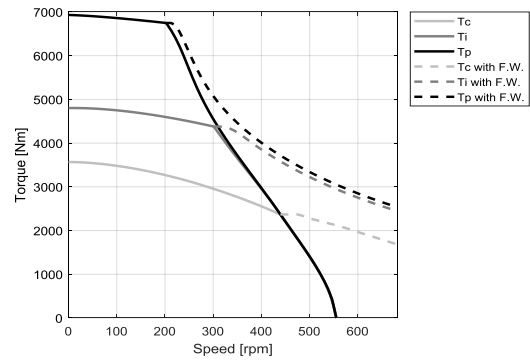
3UPN - WATER COOLING



3UZN - WATER COOLING



3UZN - WATER COOLING



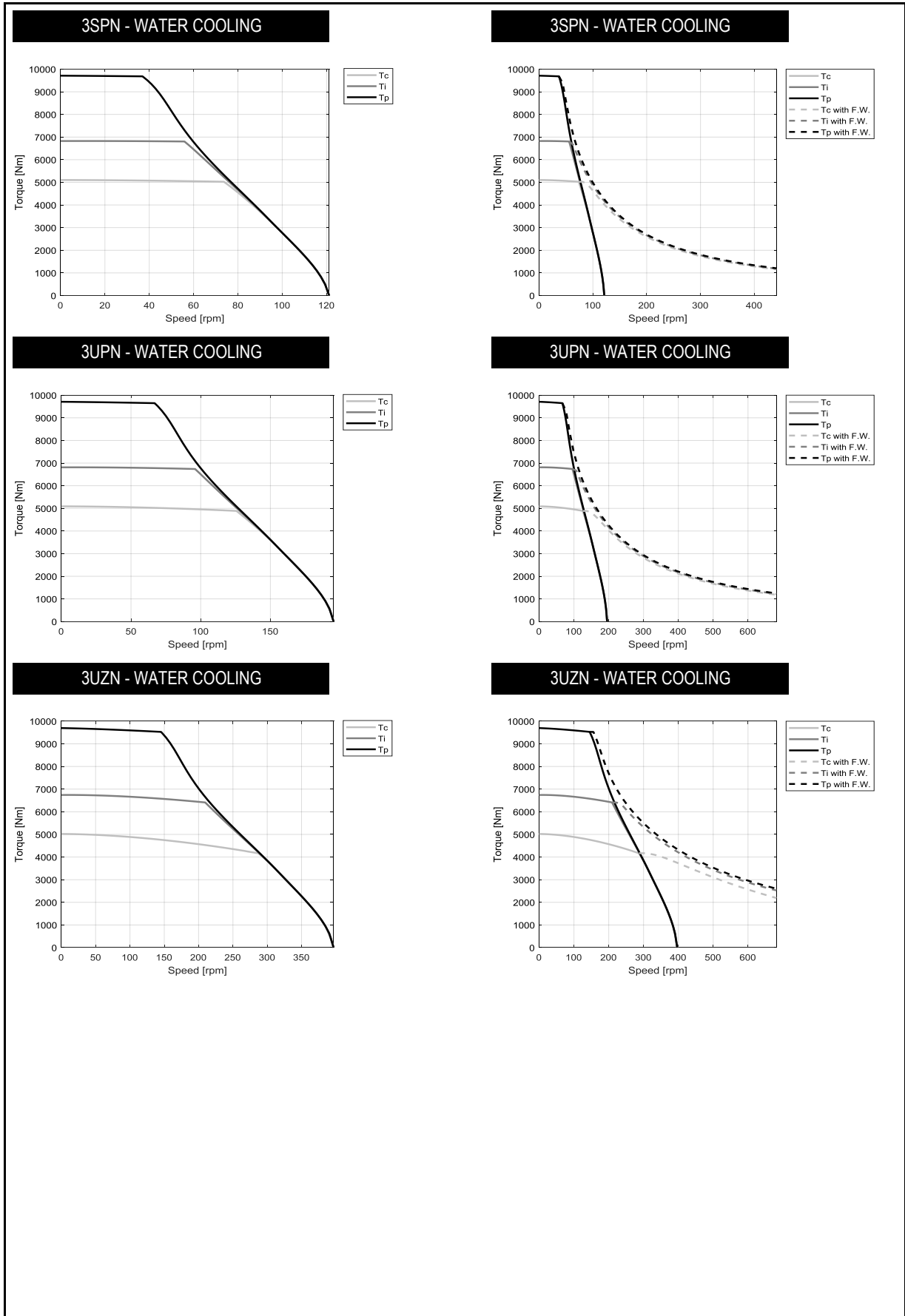
MOTOR PERFORMANCE		Winding codes	3SPN	3UPN	3UZN	
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	
Tp	Peak torque	Nm	9710	9710	9700	
Ti	Intermittent torque	Nm	6820	6810	6740	
Tc	Continuous torque	Nm	5100	5090	5020	
Ts	Standstill torque	Nm	4080	4070	4000	
Ip	Peak current	Arms	357	575	1170	
Ii	Intermittent current	Arms	163	262	522	
Ic	Continuous current	Arms	103	166	330	
Is	Standstill current	Arms	78.2	126	250	
ns	Rated low speed	rpm	0.030	0.030	0.030	
nm	Maximum speed without flux weakening	rpm	121	195	397	
nm,FW	Maximum speed with flux weakening	rpm	441	682	682	
ton,p	Maximum ON time for peak cycle	s	7.8	7.7	7.0	
ton,i	Maximum ON time for intermittent cycle	s	3.0	3.0	3.0	
Pp	Power dissipation @ Ip	W	108000	109000	114000	
Pi	Power dissipation @ Ii	W	26400	26400	26400	
Pc	Power dissipation @ Ic	W	10500	10500	10500	
Td	Max. detent torque (average to peak)	Nm	20	20	20	

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	56.7	35.2	17.3	
Ku	Back EMF constant (*)	Vrms/(rad/s)	32.8	20.3	10.0	
Km	Motor constant	Nm/√W	68.2	68.0	66.7	
R20	Electrical resistance at 20°C (*)	Ohm	0.461	0.179	0.0450	
Ld/Lq	Electrical inductance (*)	mH	5.97 / 4.91	2.30 / 1.89	0.557 / 0.459	
Isc	Maximum short-circuit current	Arms	72.0	116	236	
nb	Base speed	rpm	73.7	126	287	
nb,i	Base speed at intermittent duty cycle	rpm	55.9	96.0	210	
nb,p	Base speed at peak duty cycle	rpm	36.9	67.0	145	
nn	Rated speed	rpm	65.4	112	252	
Tn	Rated torque	Nm	5040	4930	4340	
In	Rated current	Arms	101	159	281	
rth	Thermal time constant	s	229	229	228	
Rth	Thermal resistance	K/W	0.0102	0.0102	0.0102	
2p	Number of poles	-	176	176	176	
J	Rotor inertia	kg·m²	20.4	20.4	20.4	
mr	Rotor mass	kg	111	111	111	
ms	Stator mass	kg	176	176	175	

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	0.369	0.369	0.369	
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	30	30	30	
Δpw	Max. pressure drop at qw	bar	1.2	1.2	1.2	

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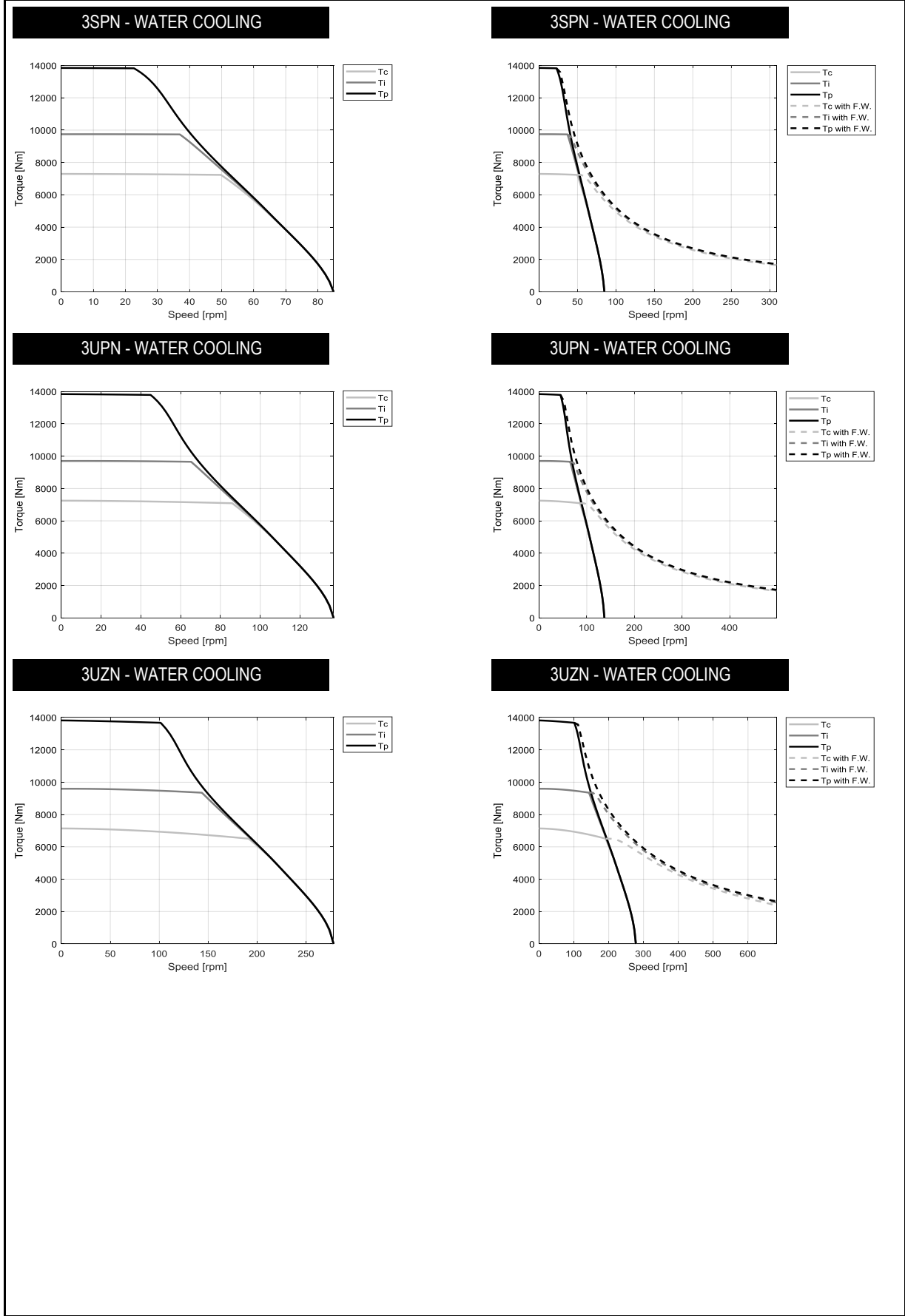
MOTOR PERFORMANCE		Winding codes	3SPN	3UPN	3UZN	
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	
Tp	Peak torque	Nm	13800	13800	13800	
Ti	Intermittent torque	Nm	9750	9700	9590	
Tc	Continuous torque	Nm	7290	7250	7140	
Ts	Standstill torque	Nm	5840	5800	5690	
Ip	Peak current	Arms	357	575	1170	
Ii	Intermittent current	Arms	164	262	521	
Ic	Continuous current	Arms	104	166	330	
Is	Standstill current	Arms	78.5	125	250	
ns	Rated low speed	rpm	0.030	0.030	0.031	
nm	Maximum speed without flux weakening	rpm	84.9	137	278	
nm,FW	Maximum speed with flux weakening	rpm	309	498	682	
ton,p	Maximum ON time for peak cycle	s	6.6	6.3	5.7	
ton,i	Maximum ON time for intermittent cycle	s	3.0	3.0	3.0	
Pp	Power dissipation @ Ip	W	143000	146000	153000	
Pi	Power dissipation @ Ii	W	35000	35000	35000	
Pc	Power dissipation @ Ic	W	14000	14000	14000	
Td	Max. detent torque (average to peak)	Nm	28	28	28	

MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	81.0	50.3	24.8	
Ku	Back EMF constant (*)	Vrms/(rad/s)	46.8	29.0	14.3	
Km	Motor constant	Nm/√W	84.9	84.2	82.5	
R20	Electrical resistance at 20°C (*)	Ohm	0.608	0.238	0.0600	
Ld/Lq	Electrical inductance (*)	mH	8.36 / 6.91	3.22 / 2.66	0.781 / 0.647	
Isc	Maximum short-circuit current	Arms	73.5	118	240	
nb	Base speed	rpm	49.8	85.9	191	
nb,i	Base speed at intermittent duty cycle	rpm	37.0	65.3	143	
nb,p	Base speed at peak duty cycle	rpm	22.7	44.9	101	
nn	Rated speed	rpm	44.0	76.4	170	
Tn	Rated torque	Nm	7240	7120	6630	
In	Rated current	Arms	103	162	302	
rth	Thermal time constant	s	224	224	223	
Rth	Thermal resistance	K/W	0.00751	0.00752	0.00752	
2p	Number of poles	-	176	176	176	
J	Rotor inertia	kg·m²	27.0	27.0	27.0	
mr	Rotor mass	kg	147	147	147	
ms	Stator mass	kg	217	217	217	

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	0.449	0.449	0.449	
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	20	20	20	
Δpw	Max. pressure drop at qw	bar	0.7	0.7	0.7	

Notes: (*) terminal to terminal.
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MOTOR PERFORMANCE		Winding codes	3SPN	3UPN	3UZN	
		UNIT	WATER COOLING	WATER COOLING	WATER COOLING	
Tp	Peak torque	Nm	20800	20700	20700	
Ti	Intermittent torque	Nm	14600	14600	14500	
Tc	Continuous torque	Nm	11000	10900	10800	
Ts	Standstill torque	Nm	8800	8730	8640	
Ip	Peak current	Arms	357	575	1170	
Ii	Intermittent current	Arms	165	264	530	
Ic	Continuous current	Arms	104	167	335	
Is	Standstill current	Arms	79.1	126	254	
ns	Rated low speed	rpm	0.032	0.032	0.032	
nm	Maximum speed without flux weakening	rpm	56.6	91.3	185	
nm,FW	Maximum speed with flux weakening	rpm	206	332	674	
ton,p	Maximum ON time for peak cycle	s	5.7	5.5	5.2	
ton,i	Maximum ON time for intermittent cycle	s	3.0	3.0	3.0	
Pp	Power dissipation @ Ip	W	199000	203000	209000	
Pi	Power dissipation @ Ii	W	49800	49700	49700	
Pc	Power dissipation @ Ic	W	19900	19900	19900	
Td	Max. detent torque (average to peak)	Nm	42	42	42	

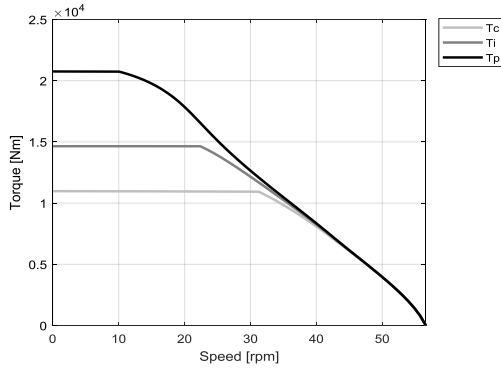
MOTOR SETTING		UNIT				
Kt	Torque constant	Nm/Arms	122	75.4	37.1	
Ku	Back EMF constant (*)	Vrms/(rad/s)	70.2	43.6	21.5	
Km	Motor constant	Nm/√W	108	107	106	
R20	Electrical resistance at 20°C (*)	Ohm	0.850	0.333	0.0825	
Ld/Lq	Electrical inductance (*)	mH	11.9 / 10.1	4.56 / 3.87	1.11 / 0.940	
Isc	Maximum short-circuit current	Arms	77.7	125	254	
nb	Base speed	rpm	31.3	55.5	123	
nb,i	Base speed at intermittent duty cycle	rpm	22.4	42.1	94.8	
nb,p	Base speed at peak duty cycle	rpm	10.1	27.3	67.8	
nn	Rated speed	rpm	27.3	49.2	110	
Tn	Rated torque	Nm	10900	10800	10400	
In	Rated current	Arms	104	165	320	
rth	Thermal time constant	s	211	211	210	
Rth	Thermal resistance	K/W	0.00528	0.00529	0.00529	
2p	Number of poles	-	176	176	176	
J	Rotor inertia	kg·m²	38.1	38.1	38.1	
mr	Rotor mass	kg	207	207	207	
ms	Stator mass	kg	290	290	290	

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	0.583	0.583	0.583	
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	29	29	29	
Δpw	Max. pressure drop at qw	bar	1.2	1.2	1.2	

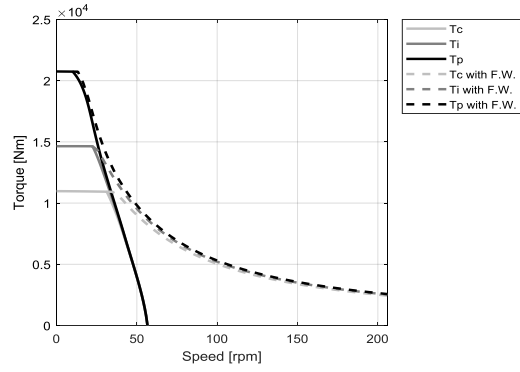
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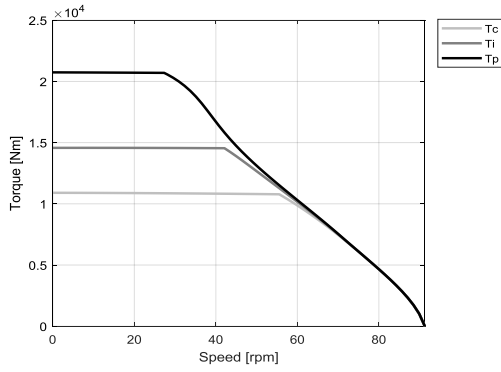
3SPN - WATER COOLING



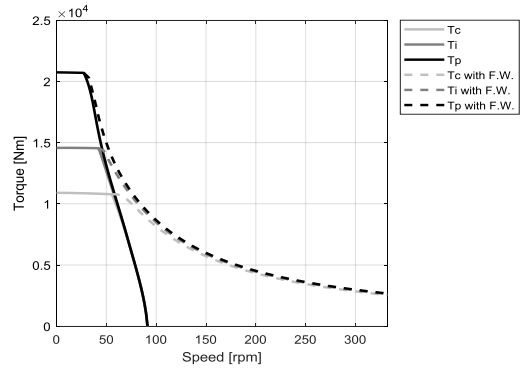
3SPN - WATER COOLING



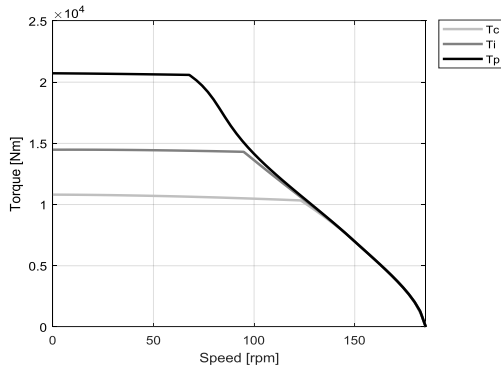
3UPN - WATER COOLING



3UPN - WATER COOLING



3UZN - WATER COOLING



3UZN - WATER COOLING

