

Linear Motors

LMG DATA SHEETS

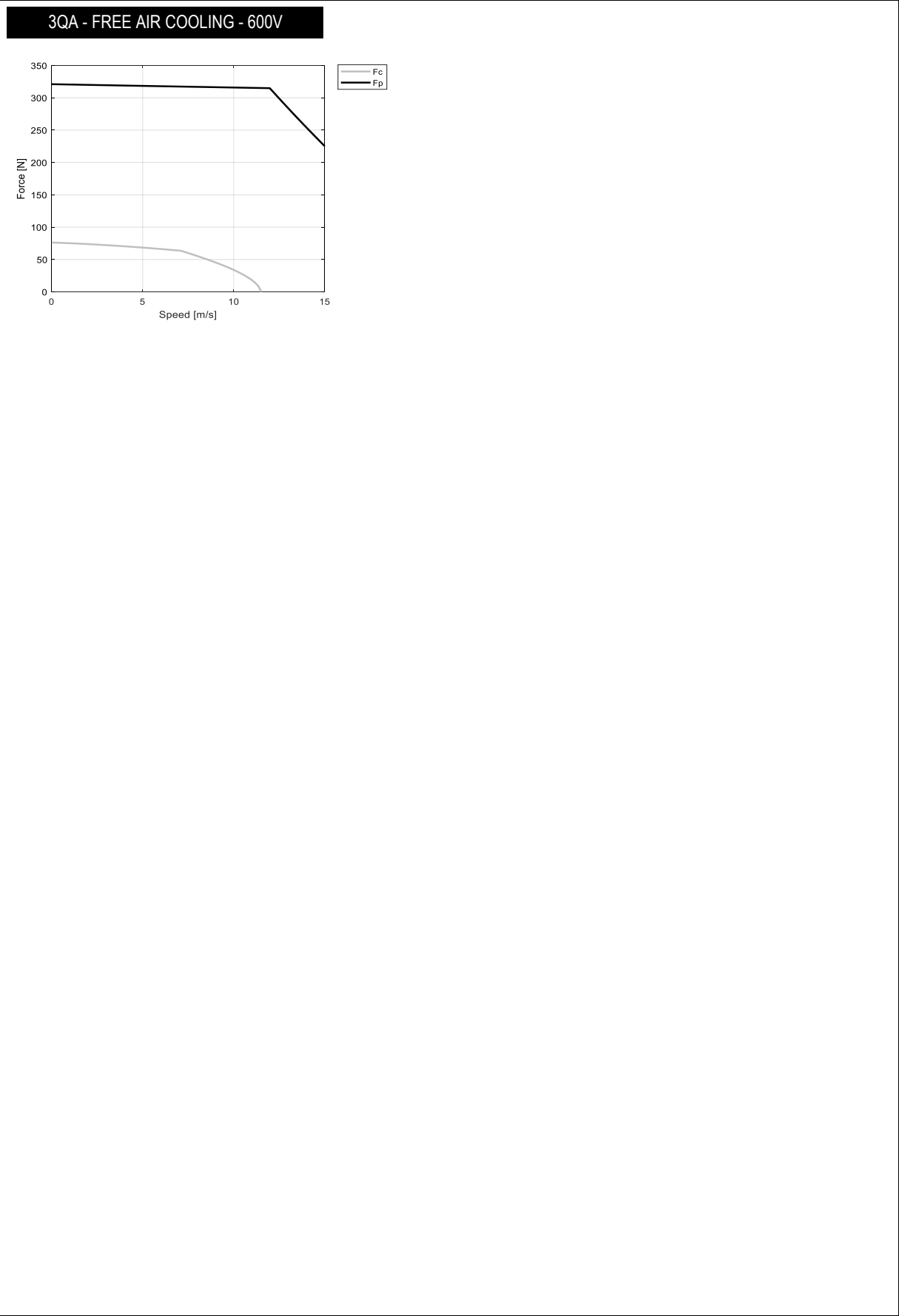
ETEL

MOTOR PERFORMANCE		Winding codes	3QA			
		UNIT	FREE AIR COOLING			
Fp	Peak force	N	321			
Fc	Continuous force	N	76.2			
Fs	Standstill force	N	57.7			
Ip	Peak current	Arms	17.2			
Ic	Continuous current	Arms	2.56			
Is	Standstill current	Arms	1.94			
vs	Rated low speed	mm/s	0.20			
Pc	Power dissipation @ Ic	W	47.0			
Fd	Max. detent force (average to peak)	N	9.0			
Fa	Attraction force	N	767			

MOTOR SETTING		UNIT				
Kt	Force constant	N/Arms	30.8			
Ku	Back EMF constant (*)	Vrms/(m/s)	18.7			
Km	Motor constant	N/√W	13.8			
R20	Electrical resistance at 20°C (*)	Ohm	3.35			
L	Electrical inductance (*)	mH	14.9			
rth	Thermal time constant	s	1570			
Rth	Thermal resistance	K/W	2.32			
2tp	Magnetic period	mm	32			
mw	Magnetic way mass	kg/m	3.51			
mm	Motor mass	kg	0.587			

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600			
Gm	Mechanical gap	mm	0.90			
Ss	Stator exchange surface	m²	0.01			
x	Assumed stroke	m	0.29			
θamb	Ambient temperature	°C	20			
θmax	Maximum coil temperature	°C	130			

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
Caution: Any use of the motor beyond speed/force 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.



MOTOR PERFORMANCE		Winding codes	3QA			
		UNIT	FREE AIR COOLING			
Fp	Peak force	N	559			
Fc	Continuous force	N	119			
Fs	Standstill force	N	90.4			
Ip	Peak current	Arms	17.2			
Ic	Continuous current	Arms	2.41			
Is	Standstill current	Arms	1.82			
vs	Rated low speed	mm/s	0.18			
Pc	Power dissipation @ Ic	W	58.3			
Fd	Max. detent force (average to peak)	N	15			
Fa	Attraction force	N	1300			

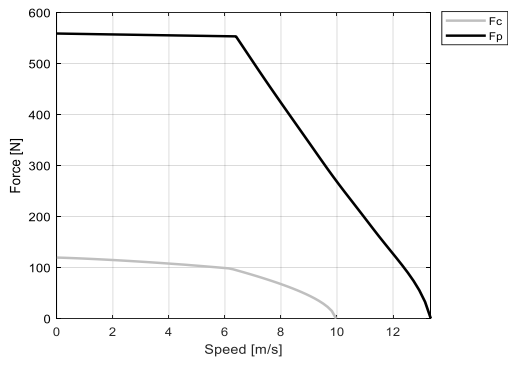
MOTOR SETTING		UNIT				
Kt	Force constant	N/Arms	51.6			
Ku	Back EMF constant (*)	Vrms/(m/s)	31.1			
Km	Motor constant	N/√W	19.4			
R20	Electrical resistance at 20°C (*)	Ohm	4.70			
L	Electrical inductance (*)	mH	27.4			
rth	Thermal time constant	s	1800			
Rth	Thermal resistance	K/W	1.87			
2tp	Magnetic period	mm	32			
mw	Magnetic way mass	kg/m	6.19			
mm	Motor mass	kg	0.878			

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600			
Gm	Mechanical gap	mm	0.90			
Ss	Stator exchange surface	m²	0.01			
x	Assumed stroke	m	0.29			
θamb	Ambient temperature	°C	20			
θmax	Maximum coil temperature	°C	130			

Notes: (*) terminal to terminal.
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3QA - FREE AIR COOLING - 600V

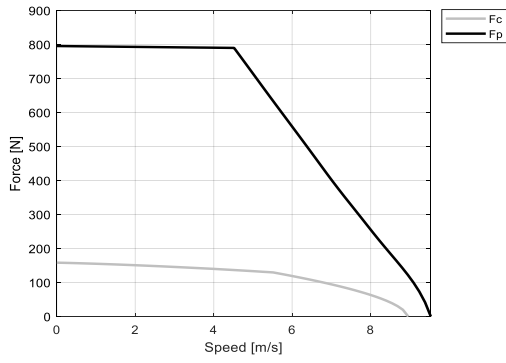


MOTOR PERFORMANCE		Winding codes	3QA			
		UNIT	FREE AIR COOLING			
Fp	Peak force	N	795			
Fc	Continuous force	N	158			
Fs	Standstill force	N	120			
Ip	Peak current	Arms	17.2			
Ic	Continuous current	Arms	2.30			
Is	Standstill current	Arms	1.74			
vs	Rated low speed	mm/s	0.16			
Pc	Power dissipation @ Ic	W	68.2			
Fd	Max. detent force (average to peak)	N	21			
Fa	Attraction force	N	1720			

MOTOR SETTING		UNIT				
Kt	Force constant	N/Arms	72.0			
Ku	Back EMF constant (*)	Vrms/(m/s)	43.5			
Km	Motor constant	N/√W	23.9			
R20	Electrical resistance at 20°C (*)	Ohm	6.05			
L	Electrical inductance (*)	mH	35.9			
rth	Thermal time constant	s	1970			
Rth	Thermal resistance	K/W	1.60			
2tp	Magnetic period	mm	32			
mw	Magnetic way mass	kg/m	7.96			
mm	Motor mass	kg	1.17			

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600			
Gm	Mechanical gap	mm	0.90			
Ss	Stator exchange surface	m²	0.02			
x	Assumed stroke	m	0.29			
θamb	Ambient temperature	°C	20			
θmax	Maximum coil temperature	°C	130			

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3QA - FREE AIR COOLING - 600V

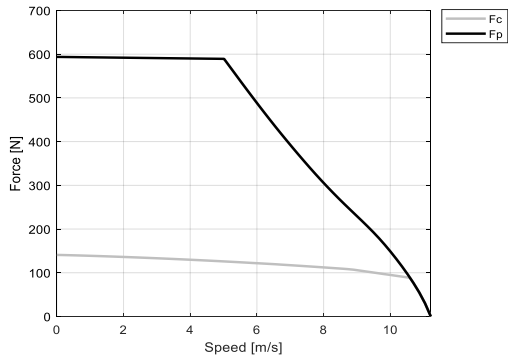
MOTOR PERFORMANCE		Winding codes	3QA	3QB		
		UNIT	FREE AIR COOLING	FREE AIR COOLING		
Fp	Peak force	N	594	594		
Fc	Continuous force	N	141	141		
Fs	Standstill force	N	107	107		
Ip	Peak current	Arms	15.5	31.0		
Ic	Continuous current	Arms	2.39	4.79		
Is	Standstill current	Arms	1.81	3.62		
vs	Rated low speed	mm/s	0.18	0.18		
Pc	Power dissipation @ Ic	W	82.2	82.2		
Fd	Max. detent force (average to peak)	N	9.5	9.5		
Fa	Attraction force	N	1320	1320		

MOTOR SETTING		UNIT				
Kt	Force constant	N/Arms	61.1	30.5		
Ku	Back EMF constant (*)	Vrms/(m/s)	37.0	18.5		
Km	Motor constant	N/√W	19.3	19.3		
R20	Electrical resistance at 20°C (*)	Ohm	6.70	1.68		
L	Electrical inductance (*)	mH	36.2	9.05		
rth	Thermal time constant	s	1750	1750		
Rth	Thermal resistance	K/W	1.33	1.33		
2tp	Magnetic period	mm	32	32		
mw	Magnetic way mass	kg/m	3.51	3.51		
mm	Motor mass	kg	1.10	1.10		

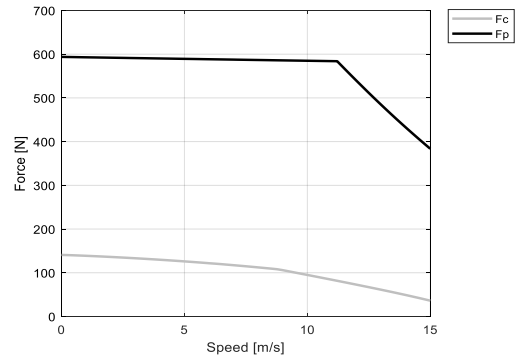
MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600		
Gm	Mechanical gap	mm	0.90	0.90		
Ss	Stator exchange surface	m²	0.02	0.02		
x	Assumed stroke	m	0.47	0.47		
θamb	Ambient temperature	°C	20	20		
θmax	Maximum coil temperature	°C	130	130		

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3QA - FREE AIR COOLING - 600V



3QB - FREE AIR COOLING - 600V

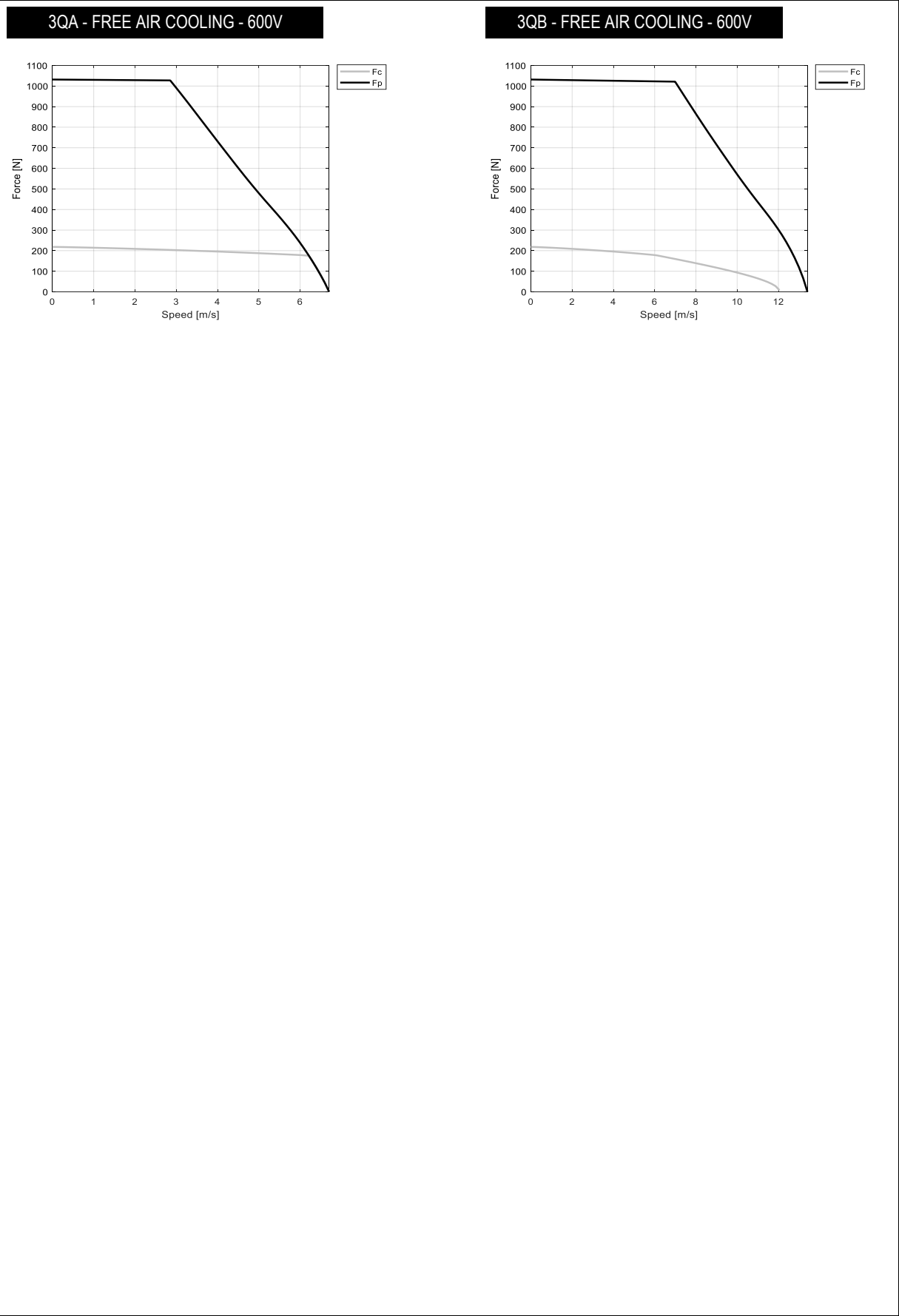


MOTOR PERFORMANCE		Winding codes	3QA	3QB		
		UNIT	FREE AIR COOLING	FREE AIR COOLING		
Fp	Peak force	N	1030	1030		
Fc	Continuous force	N	218	218		
Fs	Standstill force	N	165	165		
Ip	Peak current	Arms	15.5	31.0		
Ic	Continuous current	Arms	2.23	4.46		
Is	Standstill current	Arms	1.69	3.38		
vs	Rated low speed	mm/s	0.16	0.16		
Pc	Power dissipation @ Ic	W	99.9	99.9		
Fd	Max. detent force (average to peak)	N	16	16		
Fa	Attraction force	N	2380	2380		

MOTOR SETTING		UNIT				
Kt	Force constant	N/Arms	103	51.3		
Ku	Back EMF constant (*)	Vrms/(m/s)	61.9	31.0		
Km	Motor constant	N/√W	27.3	27.3		
R20	Electrical resistance at 20°C (*)	Ohm	9.40	2.35		
L	Electrical inductance (*)	mH	54.2	13.6		
rth	Thermal time constant	s	2030	2030		
Rth	Thermal resistance	K/W	1.09	1.09		
2tp	Magnetic period	mm	32	32		
mw	Magnetic way mass	kg/m	6.19	6.19		
mm	Motor mass	kg	1.65	1.65		

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600		
Gm	Mechanical gap	mm	0.90	0.90		
Ss	Stator exchange surface	m²	0.03	0.03		
x	Assumed stroke	m	0.47	0.47		
θamb	Ambient temperature	°C	20	20		
θmax	Maximum coil temperature	°C	130	130		

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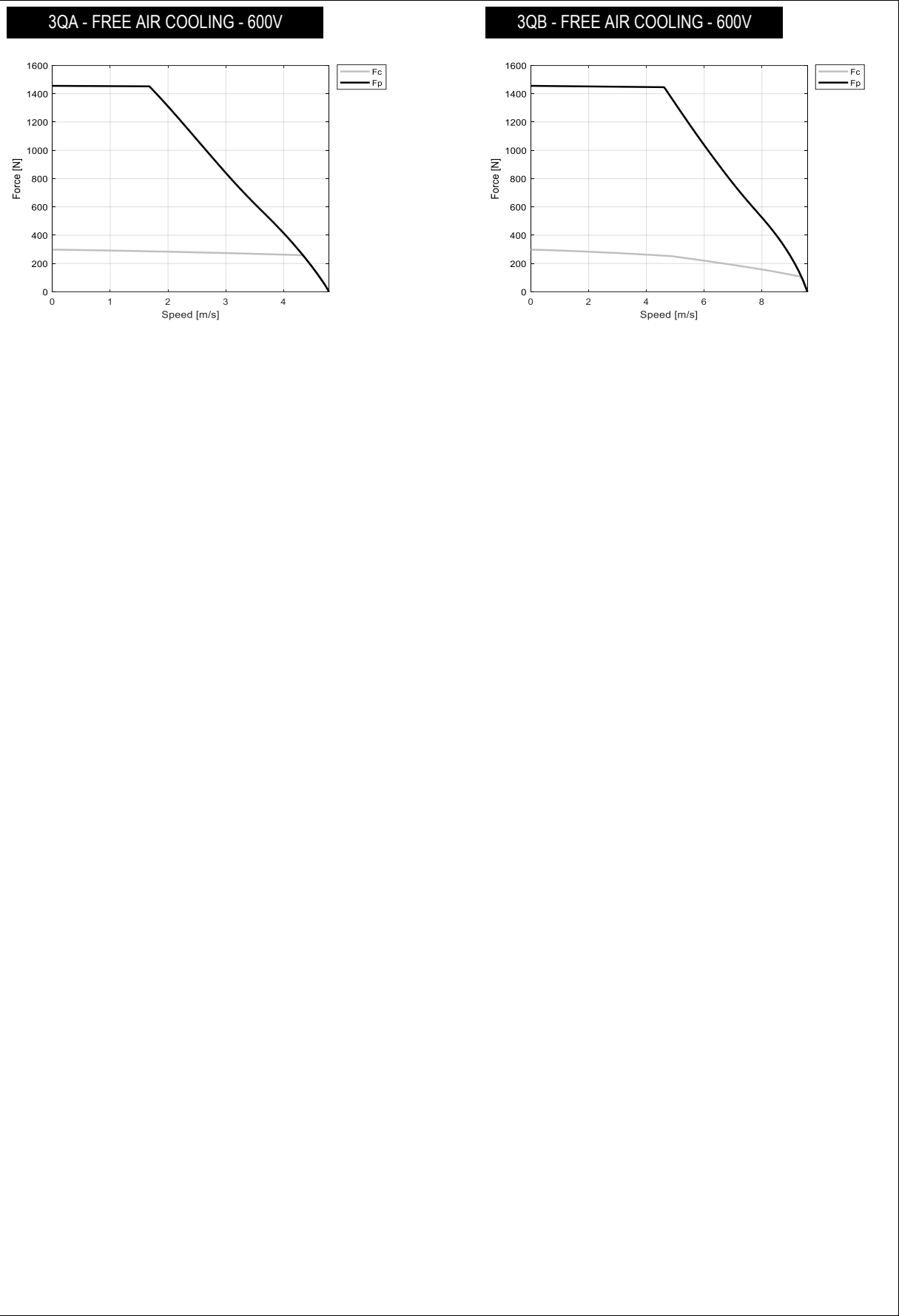


MOTOR PERFORMANCE		Winding codes	3QA	3QB		
		UNIT	FREE AIR COOLING	FREE AIR COOLING		
Fp	Peak force	N	1460	1460		
Fc	Continuous force	N	298	298		
Fs	Standstill force	N	226	226		
Ip	Peak current	Arms	15.5	31.0		
Ic	Continuous current	Arms	2.17	4.35		
Is	Standstill current	Arms	1.65	3.29		
vs	Rated low speed	mm/s	0.15	0.15		
Pc	Power dissipation @ Ic	W	122	122		
Fd	Max. detent force (average to peak)	N	22	22		
Fa	Attraction force	N	3310	3310		

MOTOR SETTING		UNIT				
Kt	Force constant	N/Arms	144	71.9		
Ku	Back EMF constant (*)	Vrms/(m/s)	86.7	43.4		
Km	Motor constant	N/√W	33.8	33.8		
R20	Electrical resistance at 20°C (*)	Ohm	12.1	3.02		
L	Electrical inductance (*)	mH	79.5	19.9		
rth	Thermal time constant	s	2200	2200		
Rth	Thermal resistance	K/W	0.891	0.891		
2tp	Magnetic period	mm	32	32		
mw	Magnetic way mass	kg/m	7.96	7.96		
mm	Motor mass	kg	2.19	2.19		

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600		
Gm	Mechanical gap	mm	0.90	0.90		
Ss	Stator exchange surface	m²	0.03	0.03		
x	Assumed stroke	m	0.47	0.47		
θamb	Ambient temperature	°C	20	20		
θmax	Maximum coil temperature	°C	130	130		

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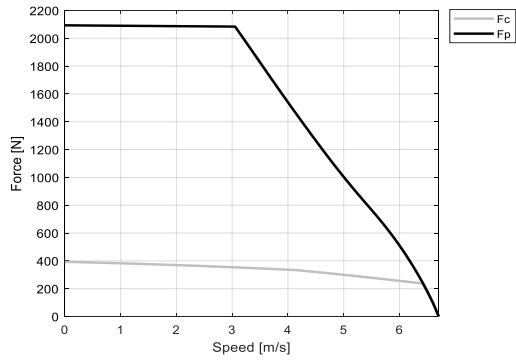
MOTOR PERFORMANCE		Winding codes	3QB			
		UNIT	FREE AIR COOLING			
Fp	Peak force	N	2090			
Fc	Continuous force	N	393			
Fs	Standstill force	N	297			
Ip	Peak current	Arms	31.0			
Ic	Continuous current	Arms	4.03			
Is	Standstill current	Arms	3.06			
vs	Rated low speed	mm/s	0.13			
Pc	Power dissipation @ Ic	W	140			
Fd	Max. detent force (average to peak)	N	32			
Fa	Attraction force	N	4760			

MOTOR SETTING		UNIT				
Kt	Force constant	N/Arms	102			
Ku	Back EMF constant (*)	Vrms/(m/s)	61.9			
Km	Motor constant	N/√W	41.6			
R20	Electrical resistance at 20°C (*)	Ohm	4.03			
L	Electrical inductance (*)	mH	27.3			
rth	Thermal time constant	s	2450			
Rth	Thermal resistance	K/W	0.775			
2tp	Magnetic period	mm	32			
mw	Magnetic way mass	kg/m	12.6			
mm	Motor mass	kg	3.00			

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600			
Gm	Mechanical gap	mm	0.90			
Ss	Stator exchange surface	m²	0.04			
x	Assumed stroke	m	0.47			
θamb	Ambient temperature	°C	20			
θmax	Maximum coil temperature	°C	130			

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3QB - FREE AIR COOLING - 600V

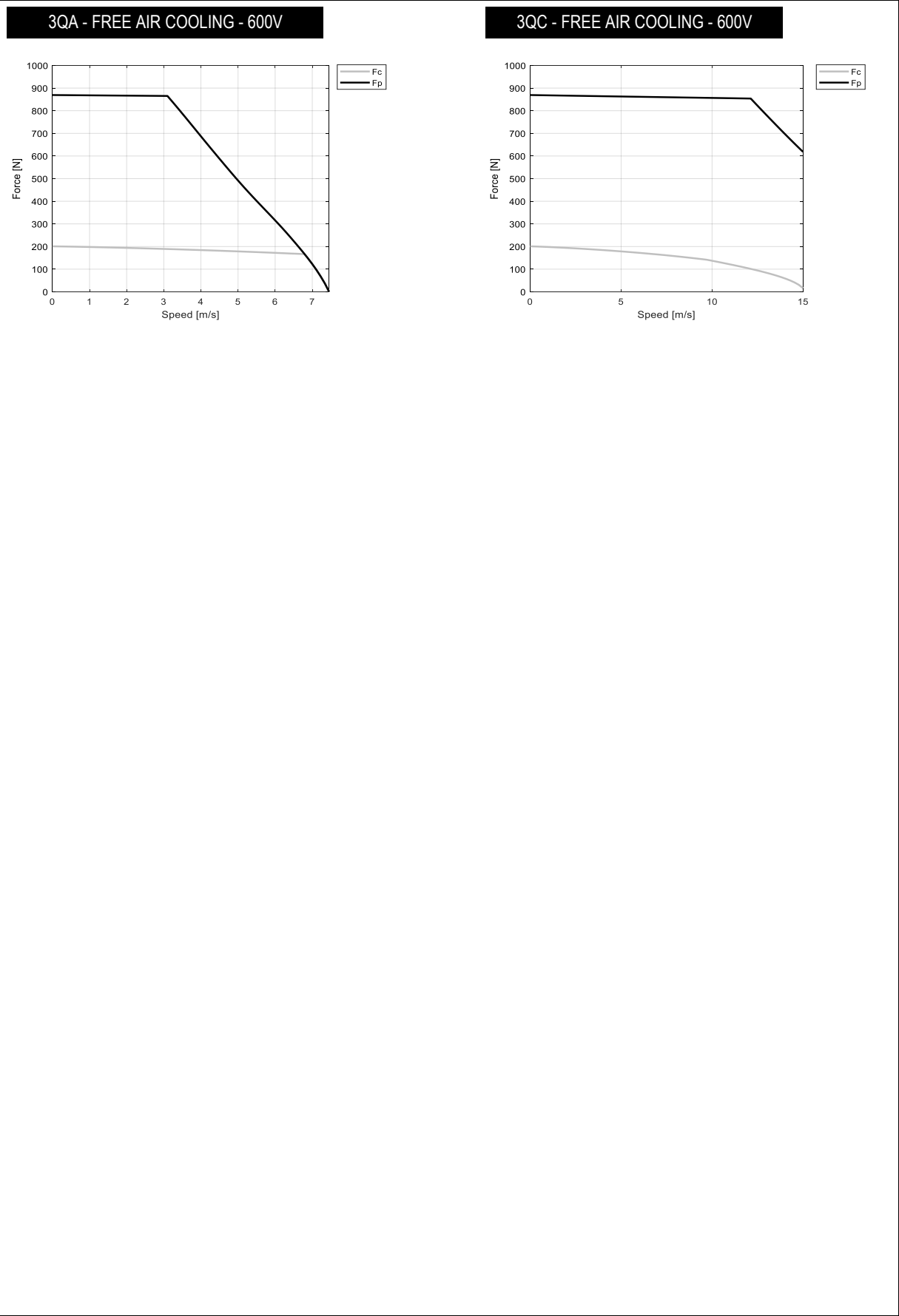


MOTOR PERFORMANCE		Winding codes	3QA	3QC		
		UNIT	FREE AIR COOLING	FREE AIR COOLING		
Fp	Peak force	N	869	869		
Fc	Continuous force	N	201	201		
Fs	Standstill force	N	152	152		
Ip	Peak current	Arms	14.9	44.7		
Ic	Continuous current	Arms	2.28	6.83		
Is	Standstill current	Arms	1.72	5.17		
vs	Rated low speed	mm/s	0.17	0.17		
Pc	Power dissipation @ Ic	W	112	112		
Fd	Max. detent force (average to peak)	N	12	12		
Fa	Attraction force	N	2060	2060		

MOTOR SETTING		UNIT				
Kt	Force constant	N/Arms	92.1	30.7		
Ku	Back EMF constant (*)	Vrms/(m/s)	55.7	18.6		
Km	Motor constant	N/√W	23.7	23.7		
R20	Electrical resistance at 20°C (*)	Ohm	10.1	1.12		
L	Electrical inductance (*)	mH	49.7	5.53		
rth	Thermal time constant	s	1850	1850		
Rth	Thermal resistance	K/W	0.981	0.981		
2tp	Magnetic period	mm	32	32		
mw	Magnetic way mass	kg/m	3.51	3.51		
mm	Motor mass	kg	1.62	1.62		

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600		
Gm	Mechanical gap	mm	0.90	0.90		
Ss	Stator exchange surface	m²	0.03	0.03		
x	Assumed stroke	m	0.51	0.51		
θamb	Ambient temperature	°C	20	20		
θmax	Maximum coil temperature	°C	130	130		

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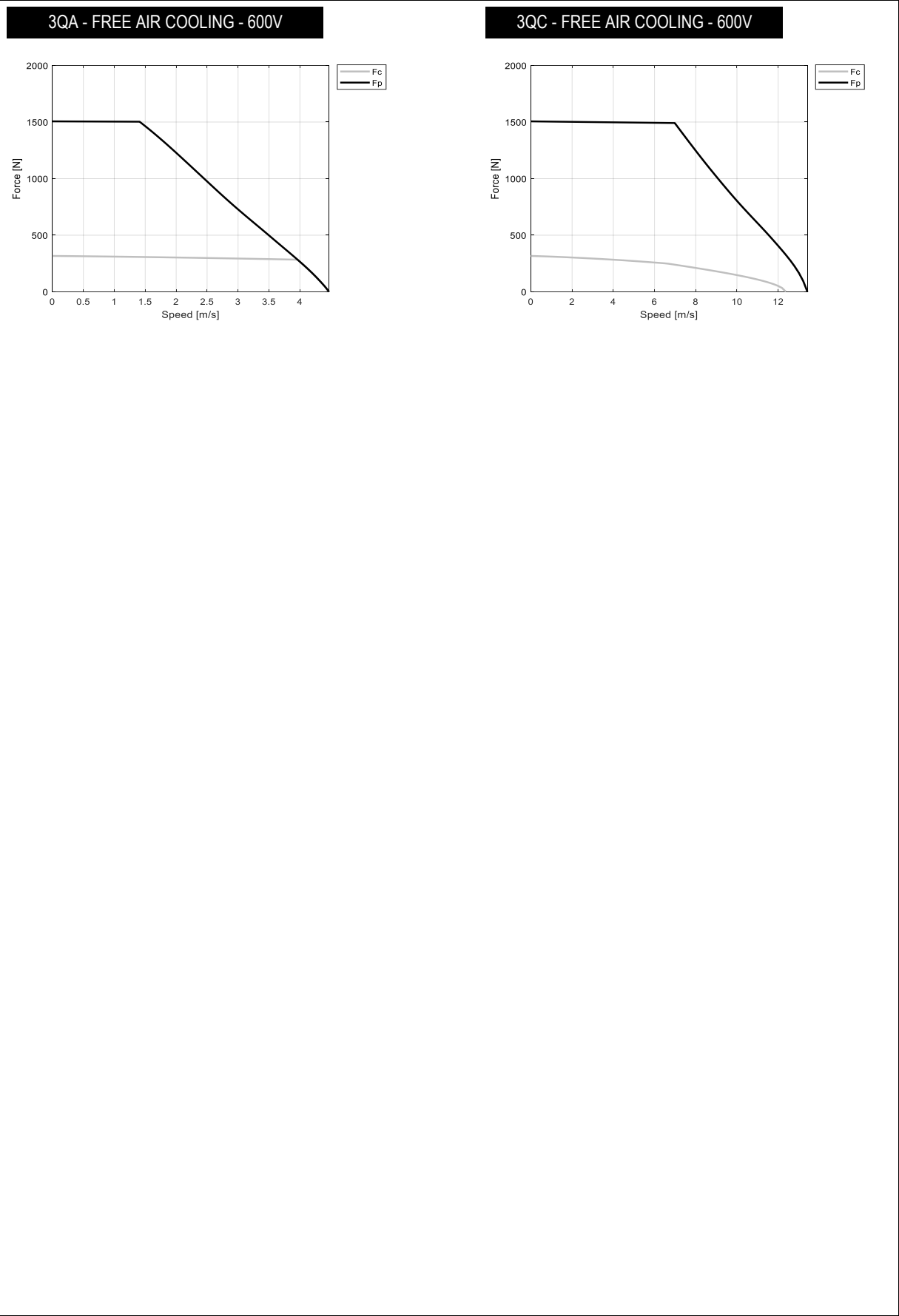


MOTOR PERFORMANCE		Winding codes	3QA	3QC		
		UNIT	FREE AIR COOLING	FREE AIR COOLING		
Fp	Peak force	N	1510	1510		
Fc	Continuous force	N	317	317		
Fs	Standstill force	N	240	240		
Ip	Peak current	Arms	14.9	44.7		
Ic	Continuous current	Arms	2.19	6.56		
Is	Standstill current	Arms	1.66	4.97		
vs	Rated low speed	mm/s	0.15	0.15		
Pc	Power dissipation @ Ic	W	144	144		
Fd	Max. detent force (average to peak)	N	20	20		
Fa	Attraction force	N	3440	3440		

MOTOR SETTING		UNIT				
Kt	Force constant	N/Arms	153	51.2		
Ku	Back EMF constant (*)	Vrms/(m/s)	92.8	30.9		
Km	Motor constant	N/√W	33.4	33.4		
R20	Electrical resistance at 20°C (*)	Ohm	14.1	1.57		
L	Electrical inductance (*)	mH	83.0	9.23		
rth	Thermal time constant	s	2110	2110		
Rth	Thermal resistance	K/W	0.757	0.757		
2tp	Magnetic period	mm	32	32		
mw	Magnetic way mass	kg/m	6.19	6.19		
mm	Motor mass	kg	2.41	2.41		

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600		
Gm	Mechanical gap	mm	0.90	0.90		
Ss	Stator exchange surface	m²	0.04	0.04		
x	Assumed stroke	m	0.51	0.51		
θamb	Ambient temperature	°C	20	20		
θmax	Maximum coil temperature	°C	130	130		

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MOTOR PERFORMANCE		Winding codes	3QC			
		UNIT	FREE AIR COOLING			
Fp	Peak force	N	2120			
Fc	Continuous force	N	429			
Fs	Standstill force	N	324			
Ip	Peak current	Arms	44.7			
Ic	Continuous current	Arms	6.37			
Is	Standstill current	Arms	4.82			
vs	Rated low speed	mm/s	0.14			
Pc	Power dissipation @ Ic	W	175			
Fd	Max. detent force (average to peak)	N	28			
Fa	Attraction force	N	4760			

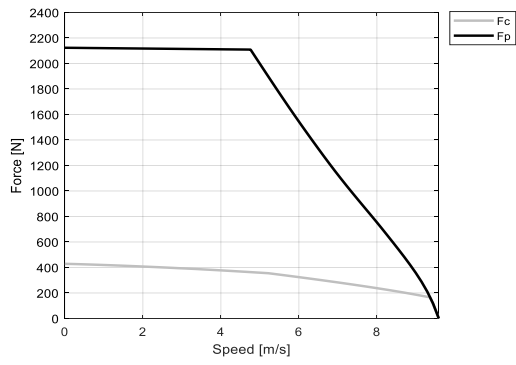
MOTOR SETTING		UNIT				
Kt	Force constant	N/Arms	71.6			
Ku	Back EMF constant (*)	Vrms/(m/s)	43.3			
Km	Motor constant	N/√W	41.2			
R20	Electrical resistance at 20°C (*)	Ohm	2.02			
L	Electrical inductance (*)	mH	12.9			
rth	Thermal time constant	s	2290			
Rth	Thermal resistance	K/W	0.623			
2tp	Magnetic period	mm	32			
mw	Magnetic way mass	kg/m	7.96			
mm	Motor mass	kg	3.21			

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600			
Gm	Mechanical gap	mm	0.90			
Ss	Stator exchange surface	m ²	0.05			
x	Assumed stroke	m	0.51			
θamb	Ambient temperature	°C	20			
θmax	Maximum coil temperature	°C	130			

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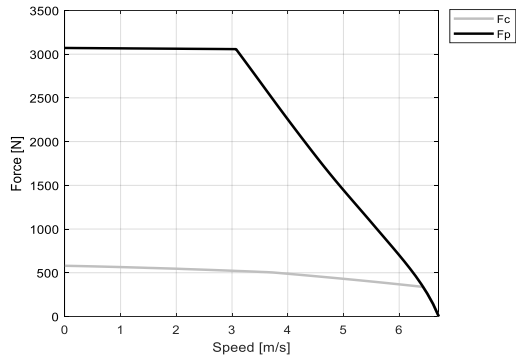
3QC - FREE AIR COOLING - 600V

MOTOR PERFORMANCE		Winding codes	3QC			
		UNIT	FREE AIR COOLING			
Fp	Peak force	N	3070			
Fc	Continuous force	N	580			
Fs	Standstill force	N	438			
Ip	Peak current	Arms	44.7			
Ic	Continuous current	Arms	6.00			
Is	Standstill current	Arms	4.55			
vs	Rated low speed	mm/s	0.13			
Pc	Power dissipation @ Ic	W	207			
Fd	Max. detent force (average to peak)	N	39			
Fa	Attraction force	N	6880			

MOTOR SETTING		UNIT				
Kt	Force constant	N/Arms	102			
Ku	Back EMF constant (*)	Vrms/(m/s)	61.9			
Km	Motor constant	N/√W	50.9			
R20	Electrical resistance at 20°C (*)	Ohm	2.69			
L	Electrical inductance (*)	mH	18.5			
rth	Thermal time constant	s	2540			
Rth	Thermal resistance	K/W	0.525			
2tp	Magnetic period	mm	32			
mw	Magnetic way mass	kg/m	12.6			
mm	Motor mass	kg	4.40			

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600			
Gm	Mechanical gap	mm	0.90			
Ss	Stator exchange surface	m²	0.06			
x	Assumed stroke	m	0.51			
θamb	Ambient temperature	°C	20			
θmax	Maximum coil temperature	°C	130			

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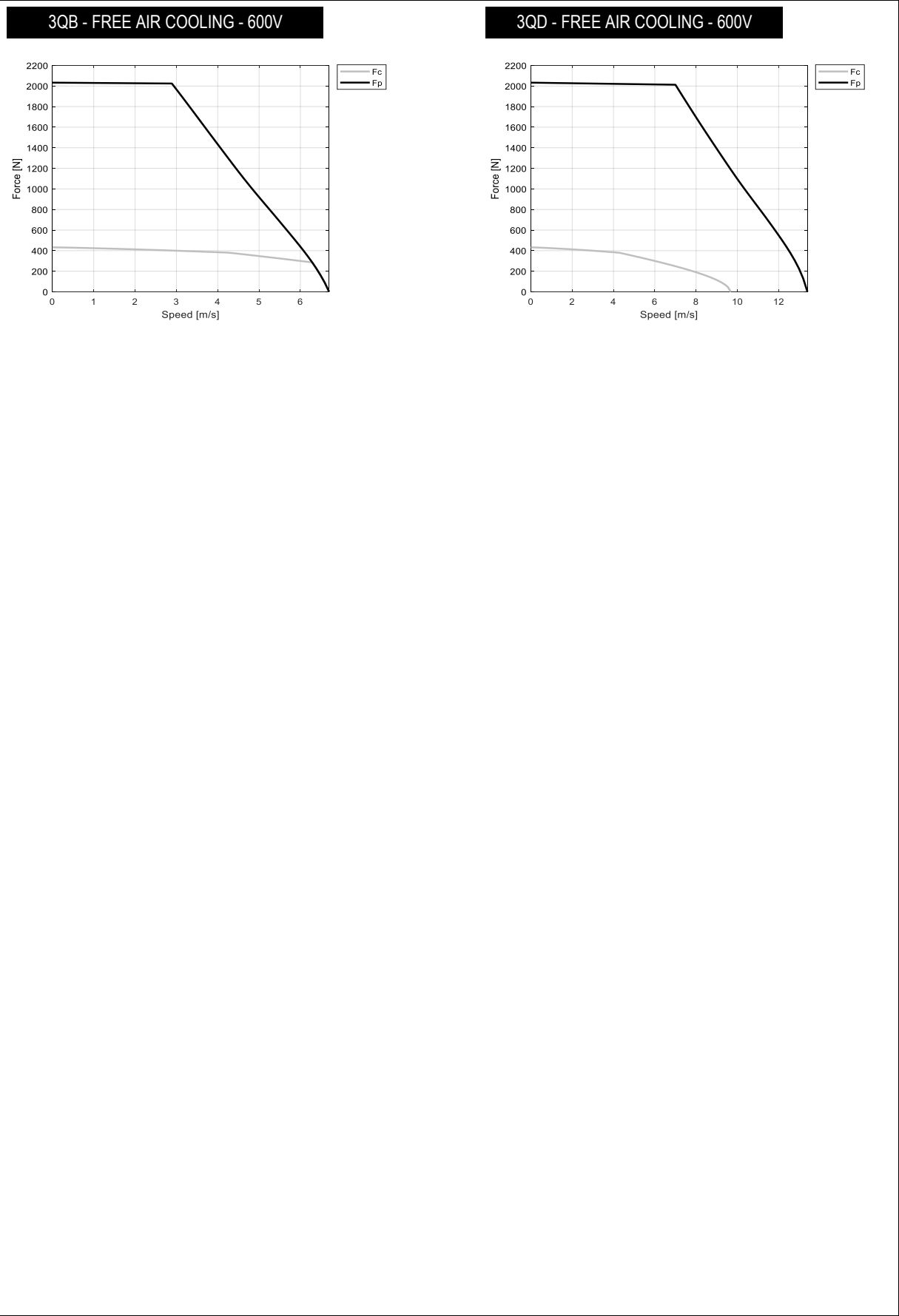
3QC - FREE AIR COOLING - 600V

MOTOR PERFORMANCE		Winding codes	3QB	3QD		
		UNIT	FREE AIR COOLING	FREE AIR COOLING		
Fp	Peak force	N	2030	2030		
Fc	Continuous force	N	433	433		
Fs	Standstill force	N	327	327		
Ip	Peak current	Arms	29.8	59.6		
Ic	Continuous current	Arms	4.44	8.88		
Is	Standstill current	Arms	3.36	6.73		
vs	Rated low speed	mm/s	0.15	0.15		
Pc	Power dissipation @ Ic	W	198	198		
Fd	Max. detent force (average to peak)	N	27	27		
Fa	Attraction force	N	4510	4510		

MOTOR SETTING		UNIT				
Kt	Force constant	N/Arms	103	51.3		
Ku	Back EMF constant (*)	Vrms/(m/s)	62.0	31.0		
Km	Motor constant	N/√W	38.7	38.7		
R20	Electrical resistance at 20°C (*)	Ohm	4.70	1.17		
L	Electrical inductance (*)	mH	27.4	6.85		
rth	Thermal time constant	s	2130	2130		
Rth	Thermal resistance	K/W	0.550	0.550		
2tp	Magnetic period	mm	32	32		
mw	Magnetic way mass	kg/m	6.19	6.19		
mm	Motor mass	kg	3.18	3.18		

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600		
Gm	Mechanical gap	mm	0.90	0.90		
Ss	Stator exchange surface	m²	0.06	0.06		
x	Assumed stroke	m	0.69	0.69		
θamb	Ambient temperature	°C	20	20		
θmax	Maximum coil temperature	°C	130	130		

Notes: (*) terminal to terminal.
 Hypotheses and tolerances are in ETEL Integration Manual.
Caution: Any use of the motor beyond speed/force 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.

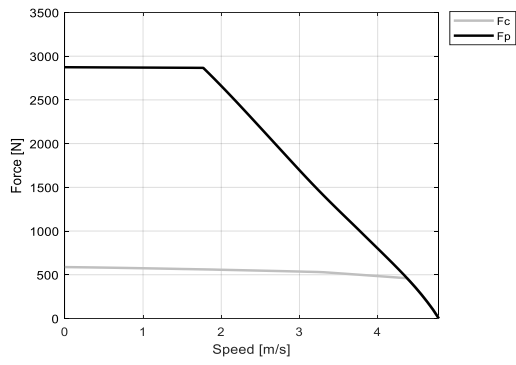
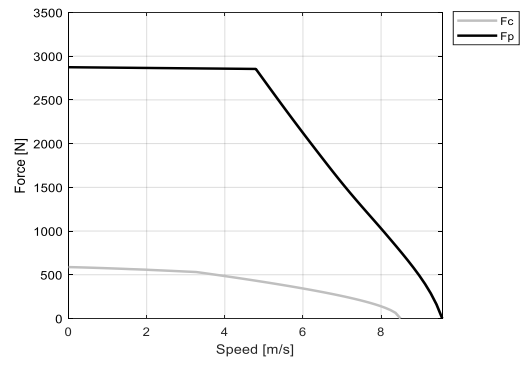


MOTOR PERFORMANCE		Winding codes	3QB	3QD		
		UNIT	FREE AIR COOLING	FREE AIR COOLING		
Fp	Peak force	N	2870	2870		
Fc	Continuous force	N	588	588		
Fs	Standstill force	N	445	445		
Ip	Peak current	Arms	29.8	59.6		
Ic	Continuous current	Arms	4.33	8.66		
Is	Standstill current	Arms	3.28	6.56		
vs	Rated low speed	mm/s	0.14	0.14		
Pc	Power dissipation @ Ic	W	243	243		
Fd	Max. detent force (average to peak)	N	37	37		
Fa	Attraction force	N	6310	6310		

MOTOR SETTING		UNIT				
Kt	Force constant	N/Arms	144	71.8		
Ku	Back EMF constant (*)	Vrms/(m/s)	86.8	43.4		
Km	Motor constant	N/√W	47.7	47.7		
R20	Electrical resistance at 20°C (*)	Ohm	6.05	1.51		
L	Electrical inductance (*)	mH	38.1	9.54		
rth	Thermal time constant	s	2300	2300		
Rth	Thermal resistance	K/W	0.449	0.449		
2tp	Magnetic period	mm	32	32		
mw	Magnetic way mass	kg/m	7.96	7.96		
mm	Motor mass	kg	4.23	4.23		

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600		
Gm	Mechanical gap	mm	0.90	0.90		
Ss	Stator exchange surface	m²	0.07	0.07		
x	Assumed stroke	m	0.69	0.69		
θamb	Ambient temperature	°C	20	20		
θmax	Maximum coil temperature	°C	130	130		

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3QB - FREE AIR COOLING - 600V**3QD - FREE AIR COOLING - 600V**

MOTOR PERFORMANCE		Winding codes	3QB	3QD		
		UNIT	FREE AIR COOLING	FREE AIR COOLING		
Fp	Peak force	N	4130	4130		
Fc	Continuous force	N	790	790		
Fs	Standstill force	N	597	597		
Ip	Peak current	Arms	29.8	59.6		
Ic	Continuous current	Arms	4.08	8.16		
Is	Standstill current	Arms	3.09	6.18		
vs	Rated low speed	mm/s	0.13	0.13		
Pc	Power dissipation @ Ic	W	288	288		
Fd	Max. detent force (average to peak)	N	53	53		
Fa	Attraction force	N	9020	9020		

MOTOR SETTING		UNIT				
Kt	Force constant	N/Arms	205	103		
Ku	Back EMF constant (*)	Vrms/(m/s)	124	61.9		
Km	Motor constant	N/√W	58.9	58.9		
R20	Electrical resistance at 20°C (*)	Ohm	8.07	2.02		
L	Electrical inductance (*)	mH	53.8	13.4		
rth	Thermal time constant	s	2550	2550		
Rth	Thermal resistance	K/W	0.378	0.378		
2tp	Magnetic period	mm	32	32		
mw	Magnetic way mass	kg/m	12.6	12.6		
mm	Motor mass	kg	5.80	5.80		

MOTOR ENVIRONMENT		UNIT				
Udc	Nominal DC bus voltage	VDC	600	600		
Gm	Mechanical gap	mm	0.90	0.90		
Ss	Stator exchange surface	m²	0.09	0.09		
x	Assumed stroke	m	0.69	0.69		
θamb	Ambient temperature	°C	20	20		
θmax	Maximum coil temperature	°C	130	130		

Notes: (*) terminal to terminal.
Hypotheses and tolerances are in ETEL Integration Manual.
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