

# Linear Motors

**ILF+ DATA SHEETS**

***ETEL***

MOTOR PERFORMANCE		Winding codes	KA	KA	NA	NA
		UNIT	FREE AIR COOLING	FORCED AIR COOLING	FREE AIR COOLING	FORCED AIR COOLING
<b>Fp</b>	Peak force	N	98.9	98.9	94.4	94.4
<b>Fc</b>	Continuous force	N	21.5	31.9	20.7	30.7
<b>Fs</b>	Standstill force	N	16.2	23.8	15.6	22.9
<b>Ip</b>	Peak current	Arms	3.52	3.52	7.37	7.37
<b>Ic</b>	Continuous current	Arms	0.745	1.10	1.58	2.33
<b>Is</b>	Standstill current	Arms	0.560	0.823	1.18	1.74
<b>vs</b>	Rated low speed	mm/s	1.0	4.0	1.1	4.1
<b>Pc</b>	Power dissipation @ Ic	W	26.6	56.4	26.4	55.8
<b>Fd</b>	Max. detent force (average to peak)	N	0.0	0.0	0.0	0.0
<b>Fa</b>	Attraction force	N	0.00	0.00	0.00	0.00

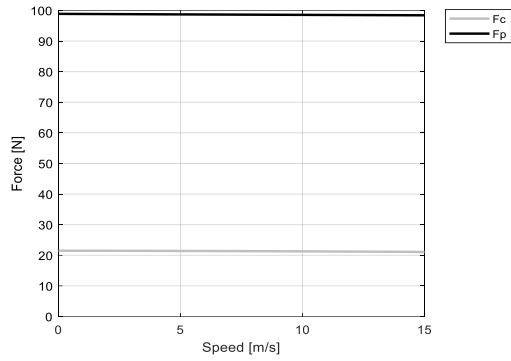
MOTOR SETTING		UNIT				
<b>Kt</b>	Force constant	N/Arms	29.5	29.5	13.4	13.4
<b>Ku</b>	Back EMF constant (*)	Vrms/(m/s)	17.9	17.9	8.17	8.17
<b>Km</b>	Motor constant	N/√W	5.04	5.04	4.87	4.87
<b>R20</b>	Electrical resistance at 20°C (*)	Ohm	22.8	22.8	5.06	5.06
<b>L</b>	Electrical inductance (*)	mH	12.3	12.3	2.55	2.55
<b>rth</b>	Thermal time constant	s	314	79.7	303	78.5
<b>Rth</b>	Thermal resistance	K/W	4.11	1.90	4.14	1.92
<b>2tp</b>	Magnetic period	mm	32	32	32	32
<b>mw</b>	Magnetic way mass	kg/m	8.16	8.16	8.16	8.16
<b>mm</b>	Motor mass	kg	0.0995	0.169	0.0959	0.165

MOTOR ENVIRONMENT		UNIT				
<b>Udc</b>	Nominal DC bus voltage	VDC	600	600	600	600
<b>Ss</b>	Stator exchange surface	m²	0.03	0.03	0.03	0.03
<b>x</b>	Assumed stroke	m	0.18	0.18	0.18	0.18
<b>θamb</b>	Ambient temperature	°C	20	20	20	20
<b>θmax</b>	Maximum coil temperature	°C	130	130	130	130
<b>θa</b>	Inlet air temperature	°C	N/A	20	N/A	20
<b>qa</b>	Minimum air flow	l/min	N/A	33	N/A	33
<b>Δpa</b>	Minimum inlet air gauge pressure	bar	N/A	0.3	N/A	0.3

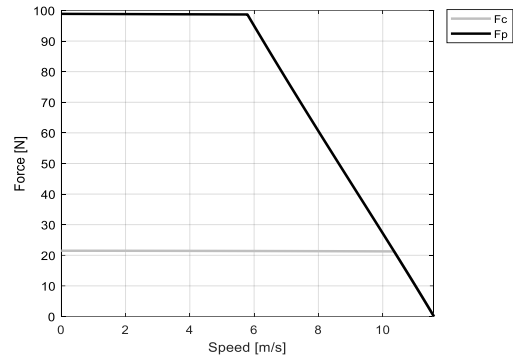
**Notes:** (\*) terminal to terminal.  
Hypotheses and tolerances are in ETEL Integration Manual.

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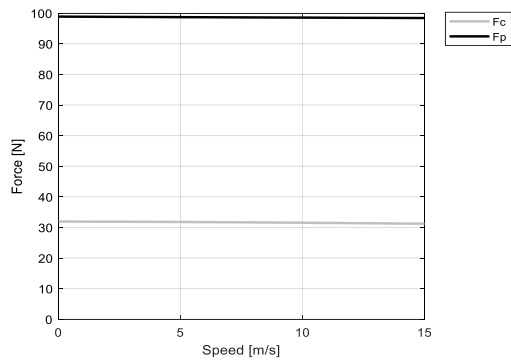
**KA - FREE AIR COOLING - 600V**



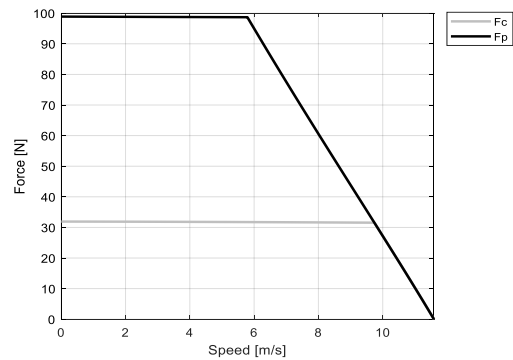
**KA - FREE AIR COOLING - 300V**



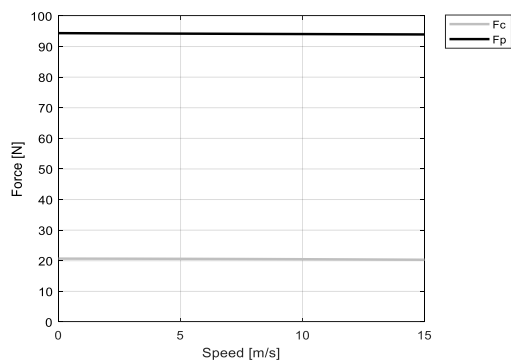
**KA - FORCED AIR COOLING - 600V**



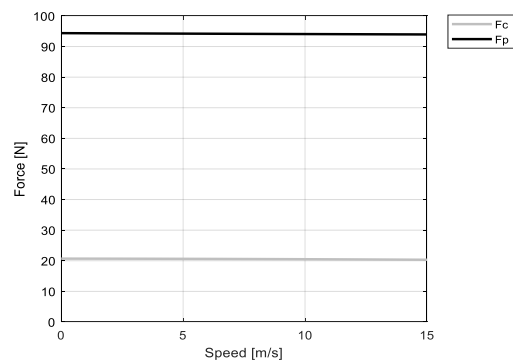
**KA - FORCED AIR COOLING - 300V**



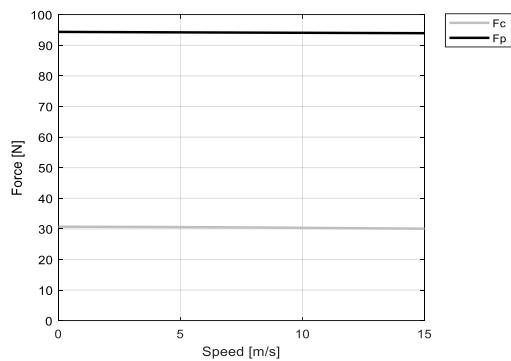
**NA - FREE AIR COOLING - 600V**



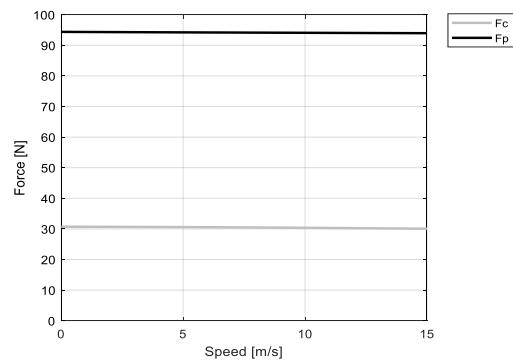
**NA - FREE AIR COOLING - 300V**



**NA - FORCED AIR COOLING - 600V**



**NA - FORCED AIR COOLING - 300V**



MOTOR PERFORMANCE		Winding codes	KB	KB	NB	NB
		UNIT	FREE AIR COOLING	FORCED AIR COOLING	FREE AIR COOLING	FORCED AIR COOLING
<b>Fp</b>	Peak force	N	198	198	189	189
<b>Fc</b>	Continuous force	N	41.3	52.3	39.8	50.3
<b>Fs</b>	Standstill force	N	31.2	39.3	30.0	37.8
<b>Ip</b>	Peak current	Arms	7.04	7.04	14.7	14.7
<b>Ic</b>	Continuous current	Arms	1.44	1.81	3.04	3.83
<b>Is</b>	Standstill current	Arms	1.08	1.36	2.29	2.88
<b>vs</b>	Rated low speed	mm/s	1.1	2.4	1.2	2.5
<b>Pc</b>	Power dissipation @ Ic	W	49.8	77.5	49.4	76.8
<b>Fd</b>	Max. detent force (average to peak)	N	0.0	0.0	0.0	0.0
<b>Fa</b>	Attraction force	N	0.00	0.00	0.00	0.00

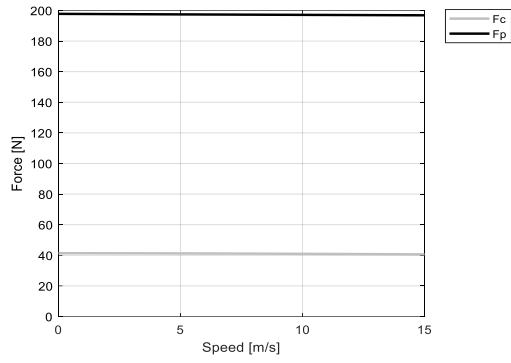
MOTOR SETTING		UNIT				
<b>Kt</b>	Force constant	N/Arms	29.5	29.5	13.4	13.4
<b>Ku</b>	Back EMF constant (*)	Vrms/(m/s)	17.9	17.9	8.17	8.17
<b>Km</b>	Motor constant	N/√W	7.12	7.12	6.89	6.89
<b>R20</b>	Electrical resistance at 20°C (*)	Ohm	11.4	11.4	2.53	2.53
<b>L</b>	Electrical inductance (*)	mH	6.13	6.13	1.27	1.27
<b>rth</b>	Thermal time constant	s	283	131	276	129
<b>Rth</b>	Thermal resistance	K/W	2.20	1.39	2.22	1.40
<b>2tp</b>	Magnetic period	mm	32	32	32	32
<b>mw</b>	Magnetic way mass	kg/m	8.16	8.16	8.16	8.16
<b>mm</b>	Motor mass	kg	0.194	0.326	0.187	0.319

MOTOR ENVIRONMENT		UNIT				
<b>Udc</b>	Nominal DC bus voltage	VDC	600	600	600	600
<b>Ss</b>	Stator exchange surface	m²	0.05	0.05	0.05	0.05
<b>x</b>	Assumed stroke	m	0.38	0.38	0.38	0.38
<b>θamb</b>	Ambient temperature	°C	20	20	20	20
<b>θmax</b>	Maximum coil temperature	°C	130	130	130	130
<b>θa</b>	Inlet air temperature	°C	N/A	20	N/A	20
<b>qa</b>	Minimum air flow	l/min	N/A	33	N/A	33
<b>Δpa</b>	Minimum inlet air gauge pressure	bar	N/A	0.3	N/A	0.3

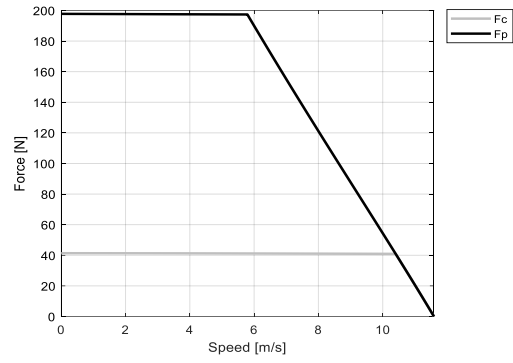
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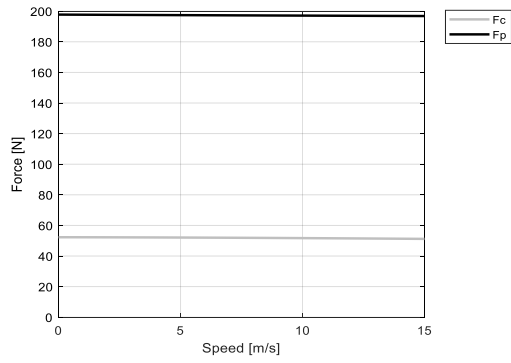
**KB - FREE AIR COOLING - 600V**



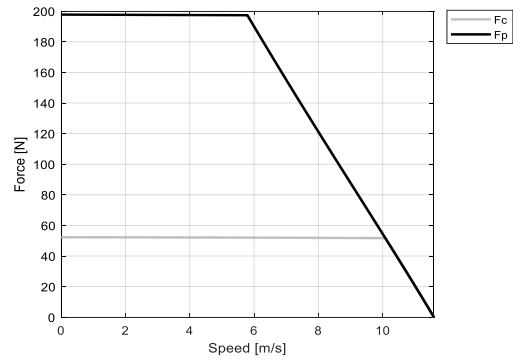
**KB - FREE AIR COOLING - 300V**



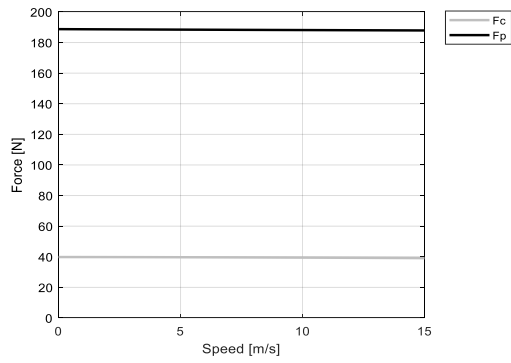
**KB - FORCED AIR COOLING - 600V**



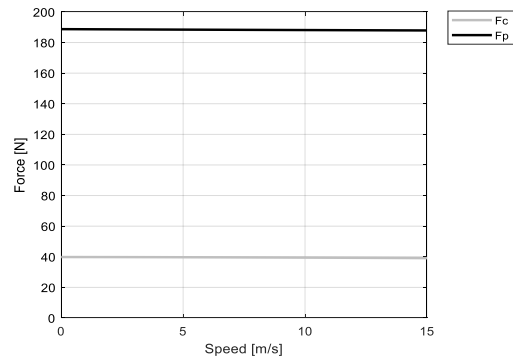
**KB - FORCED AIR COOLING - 300V**



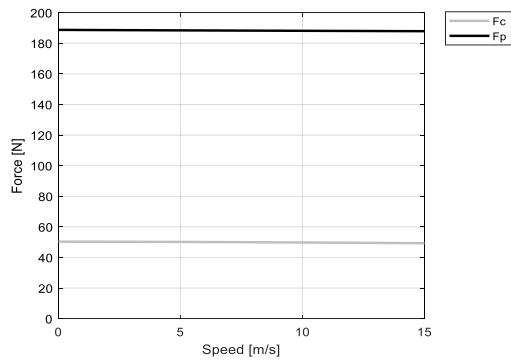
**NB - FREE AIR COOLING - 600V**



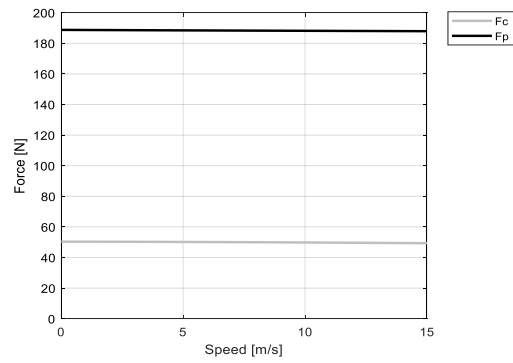
**NB - FREE AIR COOLING - 300V**



**NB - FORCED AIR COOLING - 600V**



**NB - FORCED AIR COOLING - 300V**



MOTOR PERFORMANCE		Winding codes	KC	KC	NC	NC
		UNIT	FREE AIR COOLING	FORCED AIR COOLING	FREE AIR COOLING	FORCED AIR COOLING
<b>Fp</b>	Peak force	N	297	297	283	283
<b>Fc</b>	Continuous force	N	60.6	69.4	58.3	66.9
<b>Fs</b>	Standstill force	N	45.7	52.3	44.0	50.4
<b>Ip</b>	Peak current	Arms	10.6	10.6	22.1	22.1
<b>Ic</b>	Continuous current	Arms	2.11	2.42	4.47	5.11
<b>Is</b>	Standstill current	Arms	1.60	1.82	3.37	3.85
<b>vs</b>	Rated low speed	mm/s	1.1	1.7	1.1	1.8
<b>Pc</b>	Power dissipation @ Ic	W	72.1	92.9	71.4	92.2
<b>Fd</b>	Max. detent force (average to peak)	N	0.0	0.0	0.0	0.0
<b>Fa</b>	Attraction force	N	0.00	0.00	0.00	0.00

MOTOR SETTING		UNIT				
<b>Kt</b>	Force constant	N/Arms	29.5	29.5	13.4	13.4
<b>Ku</b>	Back EMF constant (*)	Vrms/(m/s)	17.9	17.9	8.17	8.17
<b>Km</b>	Motor constant	N/√W	8.73	8.73	8.44	8.44
<b>R20</b>	Electrical resistance at 20°C (*)	Ohm	7.60	7.60	1.69	1.69
<b>L</b>	Electrical inductance (*)	mH	4.09	4.09	0.849	0.849
<b>rth</b>	Thermal time constant	s	300	184	292	181
<b>Rth</b>	Thermal resistance	K/W	1.52	1.17	1.53	1.18
<b>2tp</b>	Magnetic period	mm	32	32	32	32
<b>mw</b>	Magnetic way mass	kg/m	8.16	8.16	8.16	8.16
<b>mm</b>	Motor mass	kg	0.288	0.483	0.277	0.473

MOTOR ENVIRONMENT		UNIT				
<b>Udc</b>	Nominal DC bus voltage	VDC	600	600	600	600
<b>Ss</b>	Stator exchange surface	m²	0.08	0.08	0.08	0.08
<b>x</b>	Assumed stroke	m	0.44	0.44	0.44	0.44
<b>θamb</b>	Ambient temperature	°C	20	20	20	20
<b>θmax</b>	Maximum coil temperature	°C	130	130	130	130
<b>θa</b>	Inlet air temperature	°C	N/A	20	N/A	20
<b>qa</b>	Minimum air flow	l/min	N/A	33	N/A	33
<b>Δpa</b>	Minimum inlet air gauge pressure	bar	N/A	0.3	N/A	0.3

**Notes:** (\*) terminal to terminal.  
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