IREX

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I70 Iron Core Linear Motor Parallel Connection Specification

General Motor Specifications	UNITS	Dash #	2	4	6	8	10	12
Attractive Preload Force using 0.5mm[.02"] clearance gap	N		547	1095	1642	2189	2737	3284
	Lbf		123	246	369	492	615	738
Attractive Preload Force using 1.0mm[.04"] clearance gap	N		465	931	1396	1861	2326	2792
	Lbf		105	209	314	418	523	628
Max Operating Temperature	°C		125	125	125	125	125	125
Maximum Temp. Rise	°C		105	105	105	105	105	105
Coil Resistance (6 lead @ 25°C)	Ω		1.3	2.5	3.8	5.0	6.3	7.6
Coil Resistance (6 lead @ Max. °C)	Ω		1.8	3.6	5.3	7.1	8.9	10.7
Inductance @ 1kHz	mH		2	4	5	7	9	11
Thermal Resistance (Bracket Top Mount)	°C/W		0.23	0.10	0.07	0.05	0.04	0.03
Continuous Power Top Mount (Max. °C)	W		466	931	1506	1862	2328	2793
Continuous Power, top mount to plate**(Max. °C)	W		264	529	544	1057	1322	1586
Motor Constant	lb_f/sqrt(W)		1.1	1.6	1.9	2.2	2.5	2.7
	N/sqrt(W)		5.1	6.9	8.5	9.8	10.9	12.0
Peak Power (Max. °C, 10% Duty)	W		4656	9311	15056	18622	23278	27933
Electrical Time Constant (@ 25°C)	ms		1.4	1.4	1.4	1.4	1.4	1.4
Maximum Line to Line Voltage	Vrms		670	670	670	670	670	670
Coil Weight	Pounds		1.4	2.9	4.3	5.8	7.2	8.7
	Kilograms		0.6	1.3	2.0	2.6	3.3	4.0
Coil length (inside magnet track without HED)	inch		4.81	9.61	14.41	19.21	24.01	28.81
HED increases coil length by 1.48 inch (37.6mm)	mm		122	244	366	488	610	732
Delta Connected Specifications	**UNITS**	**Dash #**	**2**	**4**	**6**	**8**	**10**	**12**
Force Constant using 0.5mm[.02"] clearance gap	N/A		6.8	13.7	20.5	27.4	34.2	41.0
	lb_f/A		1.5	3.1	4.6	6.1	7.7	9.2
Force Constant using 1mm[.04"] clearance gap	N/A		6.2	12.3	18.5	24.6	30.8	36.9
	lb_f/A		1.4	2.8	4.2	5.5	6.9	8.3
Phase Resistance (Δ @ 25°C)	Ω		0.8	1.7	2.5	3.4	4.2	5.0
Phase Resistance (Δ @ Max. °C)	Ω		1.2	2.4	3.6	4.7	5.9	7.1
Inductance @ 1kHz	mH		1.2	2.4	3.5	4.7	5.9	7.1
Continuous Force using 0.5mm[.02"] clearance gap	N		109.4	218.8	328.2	437.6	547.1	656.5
	lb_f		24.6	49.2	73.8	98.4	123.0	147.6
Continuous Force using 1.0mm[.04"] clearance gap	N		98.5	196.9	295.4	393.9	492.4	590.8
	lb_f		22.1	44.3	66.4	88.6	110.7	132.8
Continuous Current	A		16.00	16.00	16.00	16.00	16.00	16.00
Peak Force* using 0.5mm[.02"] clearance gap	N		201	402	603	804	1005	1206
	lb_f		45	90	136	181	226	271
Peak Force* using 1.0mm[.04"] clearance gap	N		181	362	543	724	905	1086
	lb_f		41	81	122	163	203	244
Peak Current*	A		29.4	29.4	29.4	29.4	29.4	29.4
Continuous Force, aluminum plate heat sink** (see below)	N		102.1	204.2	253.6	408.3	510.4	612.5
	lbf		22.9	45.9	57.0	91.8	114.7	137.7
Back EMF Constant using 0.5mm[.02"] clearance gap	V/m/s		6.8	13.7	20.5	27.4	34.2	41.0
	V/in/s		0.2	0.3	0.5	0.7	0.9	1.0
WYE connected Specifications	**UNITS**	**Dash #**	**2**	**4**	**6**	**8**	**10**	**12**
Force Constant using 0.5mm[.02"] clearance gap	N/A		11.8	23.7	35.5	47.4	59.2	71.1
	lb_f/A		2.7	5.3	8.0	10.7	13.3	16.0
	N/A		10.7	21.3	32.0	42.6	53.3	64.0
Force Constant using 1.0mm[.04"] clearance gap	lb_f/A		2.4	4.8	7.2	9.6	12.0	14.4
Phase Resistance (Ψ @ 25°C)	Ω		2.5	5.0	7.6	10.1	12.6	15.1
Phase Resistance (Ψ @ Max. °C)	Ω		3.6	7.1	10.7	14.2	17.8	21.4
Inductance @ 1kHz	mH		3.5	7.1	10.6	14.1	17.7	21.2
Continuous Force using 0.5mm[.02"] clearance gap	N		109.4	218.8	328.2	437.6	547.1	656.5
	lb_f		24.6	49.2	73.8	98.4	123.0	147.6
Continuous Force using 0.5mm[.02"] clearance gap	N		98.5	196.9	295.4	393.9	492.4	590.8
	lb_f		22.1	44.3	66.4	88.6	110.7	132.8
Continuous Current	A		9.24	9.24	9.24	9.24	9.24	9.24
Peak Force* using 0.5mm[.02"] clearance gap	N		348	696	1045	1393	1741	2089
	lb_f		78	157	235	313	391	470
Peak Force* using 1.0mm[.04"] clearance gap	N		313	627	940	1254	1567	1880
	lb_f		70	141	211	282	352	423
Peak Current*	A		29.4	29.4	29.4	29.4	29.4	29.4
Continuous Force, aluminum plate heat sink** (see below)	N		102.1	204.2	253.6	408.3	510.4	612.5
	lbf		22.9	45.9	57.0	91.8	114.7	137.7
Back EMF Constant using 0.5mm[.02"] clearance gap	V/m/s		11.8	23.7	35.5	47.4	59.2	71.1
	V/inch/s		0.3	0.6	0.9	1.2	1.5	1.8

* Notes:

Specifications based on heat sink maintained within 10°C of ambient temperature at motor bracket interface.
On time of "Peak Power" (duration) less than 1.0 seconds.
Back EMF plus IR drop must not exceed "Maximum Terminal Voltage" listed.
Electrical cycle length is 30.5mm.
Resistance Specifications do not include the cable resistance.
Cogging force due to magnet saliency is about 45N
Custom cable required for peak current exceeding 50 ampere for any connection. Do not exceed 26 Ampere peak current (4-second maximum) for Parallel Connection
Magnet track maximum environment temperature is 50 Deg. C.
Cable adds TBDΩ/m
Shaded column represents "Special" model
** Heat Sink is a 0.5 meter wide, 15mm thick aluminum plate, extending 0.25 meter beyond each end of the coil bracket, suspended in 25 Deg. C free air using 0.5mm (.02") clearance gap.
Magnet Track weight is 3.9kg/m (2.6 pounds/foot).